МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РФ БАШКИРСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

ИНОСТРАННЫЙ ЯЗЫК В ПРОФЕССИОНАЛЬНОЙ КОММУНИКАЦИИ - 6

Материалы VI Всероссийской научно-практической конференции студентов, магистрантов, аспирантов (г. Уфа, 18 – 29 апреля 2016 г.)

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Иностранный язык в профессиональной коммуникации - 6:

Иб8 материалы VI Всероссийской научно-практической конференции студентов, магистрантов, аспирантов (г. Уфа, 18 – 29 апреля 2016 г.) / отв. ред. Н.П. Пешкова. – Уфа: РИЦ БашГУ, 2016. – 532 с. ISBN 978-5-7477-4124-9

В сборнике представлены материалы VI Всероссийской научнопрактической конференции студентов, магистрантов и аспирантов. Основной задачей конференции является создание базы для эффективного использования иностранных языков – английского, немецкого и французского – в профессиональной и научной коммуникации. На секционных заседаниях обсуждался самый широкий круг проблем: от вопросов лингвокультурологии до естественных, точных и технических наук.

Предназначено для молодых ученых, аспирантов и магистрантов, а также для студентов, заинтересованных в приобретении навыков осуществлении иноязычной профессионально-научной коммуникации.

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КУЛЬТУРА, ОБЫЧАИ И ТРАДИЦИИ СТРАН ИЗУЧАЕМОГО ЯЗЫКА

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British national identity (Британская национальная идентичность)

Over the past decades a huge variety of different cultures have immigrated to Great Britain. The first reason why people immigrate is the constantly increasing speed of the currently ongoing process of globalization. The fact that Great Britain in particular is a main target for immigration is due to the history of the Kingdom of running colonies all over the world which eventually resulted in the foundation of the Commonwealth. This multiculturalism, though being a benefit in many ways, may cause problems such as how to clearly define the national character of the British.

According to Robin Cook, who was the British Foreign Secretary from 1997 to 2001, the national character is one of multiculturalism. In his opinion, the British people cannot be defined as a race but as a "gathering of countless different [...] races", whereas Queen Elizabeth II herself defines the British people in her Golden Jubilee speech on April 30th, 2002 as a people with "traditional values etched across British history.

In contrast to the Queen, who often refers to the British history, Robin Cook argues that not even the history of Great Britain is pure British one. Throughout history, Britain has been invaded and therefore influenced by many different countries.

The main difference between Robin Cook's and Queen Elizabeth's points of view on the national character of Great Britain is that cook sees Great Britain as a nation with a whole lot of different cultures and ethnicities whereas the Queen sees it as a nation of British people who tolerate other races.

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Die Problemen der Stellensuche von Jugendlichen (Проблемы трудоустройства молодежи)

Die jungen Fachleute sind die Zukunft Russlands. Sie müssen auf dem Arbeitsmarkt gefordert werden. Ist es so in der Wirklichkeit?

Die Entwicklung der beliebigen Munizipalbildung hängt direkt von Berufsausbildung und der Möglichkeit der Arbeitsvermittlung ihrer Einwohner. Außerdem muss man die Fachkader immer mit den Kräften der Jugendlichen erneuert werden. Aber ihre niedrige Wettbewerbsfähigkeit auf dem Arbeitsmarkt, die mit der Gestaltung der neuen Gesellschaft in Russland verbunden ist, und auch das Fehlen der Berufs- und Lebenserfahrung als Überlebensvermögen führen in der Regel nicht zu der Vergrößerung der Zahl von Spezialisten in den Betrieben, sondern zu der Vergrößerung der Arbeitslosenzahl. Die wichtigen Staatsaufgaben, an der Lösung deren auch die Familie und die Schule teilnehmen, welche Weltanschaunngswerte geformt werden sollen, welche Kenntnisse und Fertigkeiten die Jugendlichen bekommen sollen, können nicht immer eindeutig gelöst werden. Davon hängt ab, wie viel die Bildungsqualität im Bildungssystem höher wird, wie überhaupt das Bildungssystem im 21. Jahrhundert wird. Es ist am wichtigsten, seinen Platz im Leben zu finden, einen Arbeitsplatz zu haben und dort sachkundig zu werden.

Keine Nachfrage auf dem Arbeitsplatz an die Jugendlichen führt dazu, dass die meisten von ihnen, darunter auch die Absolventen der Hochschulen den Arbeitsplatz in anderen Bereichen finden können. Die Weiterbildung ist für die meisten die einzige Möglichkeit eine Arbeit zu finden. Jährlich ist jeder vierte Absolvent ein Kandidat für die Weiterbildung. Außerdem verkündigt sich jeder fünfte Absolvent im Laufe eines Jahres nach dem Abschluss der Hochschule wegen der Unzufriedenheit mit dem Beruf und mit der Arbeitsart.

Auf dem Arbeitsplatz von Jugendlichen kommt zur Zeit solche schwere Situation mit der Frauenbeschäftigung zustande: traditionell bilden unter den allen Absolventen die Frauen den größten Teil, dabei ziehen die Arbeitgeber die männlichen Kandidaten vor.

Also ist existierende heute Situation auf dem russischen Arbeitsmarkt wirklich schwer. So entstehen die theoretischen und angewandten Aufgaben nach dem qualitativen und quantitativen Berufswahl, nach denen die Ausbildung in den Hochschulen geführt wird.

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British art during the Victorian period (Британское искусство во время викторианского периода)

The Victorian Era

The English Victorian Age included the years 1837 – 1901. These years marked the rule of Queen Victoria. Victoria's early reign was characterised by rapid industrial development and social and political change, which made the United Kingdom one of the most powerful and advanced nations in the world.

Victorian Art

Because of the way the Victorian society was growing, many artists were finding new subjects and ideas to express through art. Many people were becoming interested in art and this led to fantastic new arts and creations spreading through the Victorian period.

Painting

Painting in the early years of Victoria's reign was dominated by the Royal Academy of Arts and by the theories of its first president, Joshua Reynolds. Reynolds and the academy were strongly influenced by the Italian Renaissance painter Raphael, and believed that it was the role of an artist to make the subject of their work appear as noble and idealised as possible. This had proved a successful approach for artists in the pre-industrial period, where the main subjects of artistic commissions were portraits of the nobility and military and historical scenes. By the time of Victoria's accession to the throne this approach was coming to be seen as stale and outdated.

Pre-Raphaelites

The rise of the wealthy middle class had changed the art market, and a generation who had grown up in an industrial age believed in the importance of accuracy and attention to detail, and that the role of art was to reflect the world, not to idealise it.

In the late 1840s and early 1850s, a group of young art students formed the Pre-Raphaelite Brotherhood as a reaction against the teaching of the Royal Academy. This group of artists included Dante Gabriel Rossetti, John Everett Millais and William Holman Hunt. Their works were based on painting as accurately as possible from nature when able, and when painting imaginary scenes to ensure they showed as closely as possible the scene as it would have appeared, rather than distorting the subject of the painting to make it appear noble. They also felt that art should convey moral messages, so they chose subjects which would have been understood as morality tales by the audiences of the time.

They were particularly fascinated by recent scientific advances which appeared to disprove the biblical chronology, as they related to the scientists' attention to detail and willingness to challenge their own existing beliefs. Although the Pre-Raphaelite Brotherhood was relatively short-lived, their ideas were highly influential.

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Global problems: North-South divide (Глобальные проблемы: Север-Юг)

The North–South division is broadly considered as socioeconomic and political. Generally, definitions of the Global North include the United States, Canada, Western Europe and developed parts of East Asia. The Global South is made up of Africa, Latin America, and developing Asia including the Middle East. The North is home to all the members of the G8 and to four of the five permanent members of the United Nations Security Council.

The North mostly covers the West and the First World, along with much of the Second World, while the South largely corresponds with the Third World. While the North may be defined as the richer, more developed region and the South as the poorer, less developed region, many more factors differentiate between the two global areas. 95% of the North has enough food and shelter. Similarly, 95% of the North has a functioning educational system. In the South, on the other hand, only 5% of the population has enough food and shelter. It lacks appropriate technology, it has no political stability, the economies are disarticulated, and their foreign exchange earnings depend on primary product exports.

Disparities in the level of development of the "global North" and the "global South", many researchers referred to as reasons for the growth of anti-Americanism and hatred of Western civilization as a whole, the reasons for the popularity of Islamic fundamentalism and the spread of Islamist terrorism.

The growth of the polarization between rich and poor countries leads to the growth of nationalism; poor nations are trying to form their own state formations, hoping thereby to raise the national economy and gain true independence, as well as developed countries seek to national differences.

Structuralists agree that the current system of international economic relations is creating serious difficulties for developing countries. The existing system of international economic relations, in their opinion, needs to be reformed, but so that any amendments would facilitate reforms in the developing countries. As a consequence, during the multilateral economic negotiations proponents of this approach insist on developed countries are to admit the peculiarities and objective difficulties of economic growth in developing countries and are to expand their trade preferences. Nowadays such a balanced approach to the problem of North-South cooperation is receiving recognition by the international community and exactly its implementation could show the aspects of solving such a problem as North-South division.

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Education systems in Britain and Russia (Образование в Британии и в России)

English education, of course, is one of the most prestigious and opens different possibilities and prospects for future for children. As it is known parents in the UK can choose where their children will study: it can be a public school or a private (paid) school. If we speak about Russia, we have such options too now.

Although private schools offer the same set of disciplines as the state ones, and prepare their students for exams in the same state, the status of "independent" allows them to create their own unique style of teaching and their own atmosphere. Graduates of private schools are more focused on achieving results in their professional activities.

Private boarding schools offer education curricula from preschool to university entrance. In the UK, these schools are the most popular – there are more than 600 of those, and many of them are among the leading educational centers in the world.

The academic year in the UK lasts 3 semesters; the duration of each semester is about 12 weeks. The academic year in Russia lasts 33

weeks for the first grade students and 34 weeks for the 2-11 grade students.

The British and the Russian school systems and higher education systems differ dramatically. Besides the difference in the curricula themselves, there are huge differences in the organization of the educational process. In the UK there are schools for boys or for girls only, or co-ed schools where both boys and girls can go, full board, half board or full-time education. In Russia schools are mainly regular schools, lyceum, full board and just a few schools for girls or for boys only.

Particular features of education in Britain:

- 1) Parents send their children to preparatory courses before school.
- 2) Education is compulsory from 5 to 16 years.
- 3) All students wear uniform.
- 5) At the age of 16 students pass their national exam, after that they can go on with their education or start working.
- 6) Applicants must take an A-Level exam to enter a university.
- 7) At the age of 18 students can get a professional and higher education.
- 8) Many students can take postgraduate courses at the age of 21-22.

Particular features of education in Russia:

- 1) Many parents send their children to infant schools at the age of 2-6.
- 2) Children start their education at the age of 6-7.
- 3) Secondary school education is compulsory.
- 4) Students pass examinations and get their certificates.
- 5) Then they go for further studies at a university or college.

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Hairstyles in England in the 19th century (Прически в Англии 19 века)

The remarkable head hair of humans has gained an important significance in nearly all present societies as well as any given historical period throughout the world. The haircut has always played a significant cultural and social role. Hairstyles are both a display and can be a communication revealing social status and membership of a tribe or group.

Throughout history, people have worn their hair in a wide variety of styles, largely determined by the fashions of the culture they live in. Hairstyles are markers and signifiers of social class, age, marital status, racial identification, political beliefs and attitudes about gender.

In many cultures, often for religious reasons, women's hair is covered while in public, and in some, such as Haredi Judaism or European Orthodox communities, women's hair is shaved or cut very short, and covered with wigs.

In ancient civilizations, women's hair was often elaborately and carefully dressed in special ways. Women colored their hair, curled it, and pinned it up in a variety of ways. They set their hair in waves and curls using wet clay, which they dried in the sun and then combed out, or else by using a jelly made of quince seeds soaked in water, or curling tongs and curling irons of various kinds.

In the 1960s, many women began to wear their hair in short modern cuts such as the pixie cut, while in the 1970s, hair tended to be longer and looser. In both the 1960s and 1970s many men and women wore their hair very long and straight. Complex hair styles were definitely out in the 1960's. Many favored short, back-combed hairstyles that could be quickly styled and held in place with hair spray, softened with a long, feminine fringe. Younger women who left their hair longer tended to wear it loose or in a simple ponytail, adorning it with flowers or ribbons during the fashionable hippy phase. Women straightened their hair through chemical straightening processes, by ironing their hair at home with a clothes iron, or by rolling it up with large empty cans while wet.

Nowadays people who live in England can do a lot of different hairstyles. So people do many experiments with their hair. The mohawk is a top favorite hairstyle for men and women. Originally it suggests that you shave the sides of your head, leaving a stripe of hair, running from the center of your forehead to the back of your head. Today the original version of the mohawk isn't used so broadly. There are other genius types of this hairstyle, for example, the fauxhawk, that actually has the same idea but looks much more appealing, because no shaving is required. You can create so many looks, each one of which will be absolutely exceptional.

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Some historical facts about Cambridge (Несколько фактов из истории образования Кембриджа)

The story of the University begins in 1209 when several hundred students and scholars arrived in the little town of Cambridge after having walked 60 miles from Oxford. As was the custom then, they had joined themselves into a "Universitas" or Society – the word "University", like the word "College", meant originally a society of people with a common employment; it was only later it came to be associated with scholarship.

Those students were all churchmen and had been studying in Oxford at that city's well-known schools.

There were no Colleges in those early days and student life was very different from what it is now. Students were of all ages and came from everywhere. Those from the same part of the country tended to group together and these groups called "Nations" still exist, by the way, at some European Universities.

Life in College was strict; students were forbidden to play games, to sing, to hunt or even to dance. Books were very rare and all the lessons were in Latin language which students were supposed to speak even among themselves. They studied Grammar, Logic and Rhetoric, and when the students went for his degree examination it took some time for him to show his knowledge of these subjects. So he was allowed to bring a small stool or "Tripos" to sit on, and to this day the degree examinations at Cambridge are called "Tripos" examinations.

In 1440 King Henry VI founded King's College, and other colleges followed. Erasmus, the great Dutch scholar, was at one of these, Queen's College, from 1511-1513.

Many great men studied at Cambridge, amongst them Bacon the philosopher, Milton the poet, Cromwell the solider, and Newton the scientist.

Yet the undergraduate seems to have altered very little in six hundred years. In 1340 we hear of students being spoken to sternly for their concern with fashionable dress and in the middle of the seventeenth century a student writes home asking for more money and also for a new hat which must be "thinner and narrower in design, as is the new fashion." Today the fashion seems to be corduroy trousers and coloured waistcoats.

There are nineteen Colleges, including two for women students which were built near the end of the last century. Women students do not have very active part in University life at Cambridge, but they work harder than men and one seldom sees them outside of the classrooms.

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Der Pferdetourismus in Baschkortostan (Конный туризм в Башкортостане)

Eine der perspektivischen Richtungen in der Tourismusbranche ist unserer Meinung nach die Entwicklung des Pferdetourismus. Zurzeit kann der Pferdetourismus vielseitig sein: er umfasst den Sport, die Unterhaltung, die Heilfahrt, sowie die Rehabilitierung der Menschen mit den begrenzten Möglichkeiten.

Es gibt einige Touristenstationen in unserer Republik, die sich auf dem Pferdetourismus spezialisieren. Das sind: «Arski Kamen», «Suchow Kljutsch», «Malinowka», «Tengri» im Rayon Belorezk, «Tabyn» und «Nugusch». Pferdewanderungen als Touristenprodukt werden in Baschkortostan von den Reisefirmen "Kaga-Tour", "Kompass-Tour", "MW-Astur", «Ural-Batyr», "Arkaim Travel", "Tengri" benutzt.

Der Entwicklung des Pferdetourismus in der Republik wird eine große Aufmerksamkeit geschenkt. Jedoch gibt es einige Probleme auf diesem Gebiet: 1) die schwach entwickelte Infrastruktur, schlechter Zustand der Wanderwege; 2) Preise; 3) die Bevorzugung der Erholung im Ausland; 4) Mangel an Information über Reiseziele in unserer Republik, Mangel an Werbung für Tourismus in Baschkortostan; 5) Mangel an Fachkräften, die die Pferde schulen könnten, und auf Mangel an geschulten Pferden.

Wir haben folgende Vorschläge für die Popularisierung des Pferdetourismus erarbeitet:

1) Man muss mehr Wert auf Hippotherapie legen. Das Heilreiten leistet auf den Organismus des Menschen eine biomechanische Wirkung, es stärkt ihn. Die Hippotherapie ist auch für gesunde Menschen positiv. Außerdem würde die Hippotherapie das Interesse für Pferdetourismus in der Republik steigern.

2) Man muss mehr Aufmerksamkeit der Entwicklung und der Realisierung der Wochenend-Pferdetouren schenken. Während der Wochenend-Tour kann man sich für kürzeste Zeit und "ohne Arbeitsunterbrechung" erholen und die ganze Schönheit unserer Republik sehen.

3) Die Kumysbehandlung kann zur Entwicklung des Pferdetourismus in Baschkortostan beitragen. Die Stutenmilch hilft bei Tuberkulöse, bei Störungen des Nerven- und Verdauungssysteme. Die Kumysbehandlung ist besonders in der Republik Baschkorstostan entwickelt.

Der Pferdetourismus als eine Art des Aktivtourismus kann also eine perspektivische Rolle in der Lösung der sozialen Probleme unserer Republik spielen. Vorteile sind Schaffung der Arbeitsplätze und die Erhöhung der Einkommen der Bevölkerung. Das führt zur Erhöhung des Lebensstandards der Ortsbevölkerung, der Attraktivität unserer Region, zur Belebung des lokalen Kulturlebens. Die Entwicklung des gegebenen Tourismusbereichs wird dem Devisenzufluß in die Republik Baschkortostan und der Verbesserung der Infrastruktur beitragen. Wir hoffen, dass der Pferdetourismus eine große Popularität unter den Bewohnern Baschkortostans erobert.

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Development of the English language in Colombia (Развитие английского языка в Колумбии)

Increased political stability, a large young population and an optimistic economic growth outlook based on rich natural resources have thrown a spotlight on Colombia. Economic growth is now closely linked to creating a better-educated, English-speaking workforce. The decentralised nature of the education system has created challenges in terms of standardisation and accountability, and it's important to examine the true nature of industry demand for English speakers when considering appropriate language benchmarks for the Colombian population.

Foreign Languages Competencies Development Programme (PFDCLE) and the Colombia Bilingue plan, represents an ambitious effort on the part of the Colombian Ministry of Education (MEN) to increase human capital and raise the country's position in the global economy. While progress has been made, the goal of an English-speaking population by 2019 is largely felt to be unattainable.¹

English is widely seen as a skill for greater employability. With strong growth in industry and services being fuelled by foreign investment, English is set to become highly valued in the market. Real English acquisition is currently limited to higher socio-economic strata, where students often have access to bilingual or private education. Yet, as local programmes mature, there should be more opportunities for equitable learning.

The English culture in Colombia is growing. But, the challenges faced by English teachers - a lack of resources, motivation, access, time, language skills and contextual training - continue to present barriers to positive and equitable English acquisition in formal education. Is this policy a way to unite a nation, or is it unrealistic to expect one goal to

¹ Sánchez Solarte, A.C. and G.V. Obando Guerrero. Is Colombia ready for 'Bilingualism'? Universidad de Narino, 2008 – P. 190 – 196.

apply to such a diverse country? While the answer remains uncertain, what is known is that a major, top-down programme such as this that aims to change the linguistic culture of a nation must begin by examining the factors that shaped the culture it is trying to change.

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English Traditions (Английские Традиции)

English nation is famous for its old customs and traditions. Some of the traditional British dishes, holidays and sports are known all over the world.

The full English breakfast

The tradition of having a substantial breakfast meal has existed since the 18th century. The full English breakfast became very popular after the World War I, in those days it was served at the hotels and restaurants all over the country. The full breakfast consists of sausages, bacon and eggs, served with toasts, grilled tomatoes, baked beans and fried mushrooms.

Afternoon tea

One of the most well-known English traditions is afternoon tea – light refreshments, including tea, traditionally served around 5 p.m. English people often drink tea with milk; they may or may not add sugar. Tea is usually taken along with finger sandwiches, crumpets, scones, cakes, jam and marmalade. Traditional tea treats also include puddings, buns, muffins and biscuits.

Pancake Day

Pancake Day or Shrove Tuesday is held in February or March. It is the day, preceding Ash Wednesday – the first day of the 40 days Lent. It has been celebrated in Britain for centuries. On Pancake Day children go from house to house asking for a pancake. "Pancake races" are held all over the Britain. Contestants have to race with frying pans tossing and flipping pancakes in the air.

Marble Championship

Marble championship is an annual event which takes place on Good Friday. The participating teams, consisting of six members, have to knock out the marbles from the raised concrete ring. The winner gets a silver cup.

Guy Fawkes Night

The Guy Fawkes Night is a traditionalcelebration which is held on 5 November. Its history begins on 5 November 1605 when the Gunpowder Plot was foiled. That night Guy Fawkes, a member of the Plot, was arrested and people lit bonfires around London, celebrating the survival of the king.

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Structure of the Universe (Структура Вселенной)

It is a well known fact that most of the things on our planet have their coordinates or addresses. The address of the planet itself, however, is not very clear and requires some consideration. If we want to know the structure of the Universe, we need to know our "cosmic coordinates", and the Earth is in the first line of our "cosmic coordinates".

To start with, there is the Moon. There are only large craters formed from collisions with other space objects on it. As for the Sun, our star, apart from nourishing all the life on our planet, it also keeps all the planets of the solar system in a gravitational balance. Beginning with Mercury and the covered in clouds Venus, where the greenhouse effect has turned the planet into a hell, there comes Mars, whose area equals the total land area on the Earth. Then, there is a belt of rocky asteroids rotating between the orbits of Mars and Jupiter. Jupiter itself is superior to the mass of any other planet of the solar system, even if we combine the total mass of all the planets. Saturn, coming next, is ringed by millions of ice blocks that rotate around the planet's orbit, and each of blocks is its tiny companion Uranus and Neptune are the most distant planets, and they were not known until the Telescope was invented. Behind these planets there are tens of thousands icy worlds, Pluto being among them.

The trillions of icy comets are the last objects kept by the gravitational force of the Sun. This results in the formation of the Oort cloud, which surrounds the solar system. So, the second line of our "cosmic coordinates" is defined as Earth – Solar System.

A small dot (the galactic arm) in the Milky Way Galaxy is where we live – in about 300 light years from the center. Thus, the Milky Way Galaxy is the next line of our "cosmic coordinates": Earth – Solar System – Milky Way.

Our nearest neighbor is the Andromeda spiral galaxy. Two galaxies or a number of other smaller galaxies can be called as the "local group". This is another line in our "cosmic coordinates": Earth – Solar System – Milky Way Galaxy – Local Group.

Our home galaxy can hardly be distinguished in the "Virgo Supercluster" as it is just one of the thousands of similar galaxies. The line of Earth – Solar System – Milky Way Galaxy – Local Group – Virgo Supercluster cannot be considered the last one since the Virgo Supercluster forms only a tiny part of the universe.

Thus, we come to the Universe, which is a network of hundreds of billions of galaxies. And this is the last (for now) line of our "cosmic coordinates": Earth – Solar System – Milky Way Galaxy – Local Group – Virgo Supercluster – Observable Universe.

The issue of the universe structure is still on the agenda as there is a theory that all of these stars, planets, galaxies, superclusters of galaxies, and the observable galaxy are only a tiny bubble in an infinite sea of other similar bubbles.

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Богуславский Вячеслав

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David Beckham (Дэвид Бэкхем)

David Robert Joseph Beckham (born on the 2^{nd} of May 1975) is an English former professional footballer.

He played for Manchester United, Preston North End, Real Madrid, Milan, LA Galaxy, Paris Saint-Germaine, and the England national team.

He is the first English player to win league titles in four countries: England, Spain, the United States and France. He announced his retirement in May 2013 after a 20-year career, during which he won 19 major trophies. Known for his range of passing, crossing ability and bending free-kicks, he was twice runner-up for FIFA World Player of the Year and in 2004 he was named in the FIFA 100 list of the world's greatest living players.

Beckham's professional club career began with Manchester United, where he made his first-team debut in 1992.

In international football, Beckham made his England debut on 1 September 1996 at the age of 21. He was captain for six years, earning 58 caps during his tenure.

One of the most marketable athletes in sport, Beckham has consistently ranked among the highest earners in football, and in 2013 he was listed as the highest-paid player in the world, earning over \$50 million in the previous 12 months. He has been married to Victoria Beckham since 1999 and they have four children. He has been a UNICEF UK ambassador since 2005, and in 2015 he launched "The David Beckham UNICEF Fund" to help protect children in danger around the world.

Records:

- First Englishman to win league titles in four different countries (England, Spain, United States and France).

- First England player to score at three FIFA World Cups.

- First British footballer to play 100 UEFA Champions League games.

During his playing career (which ended in May 2013), Beckham generated an estimated £1 billion in shirt and boot sales. In 2006, Lloyd's of London insured his legs for £100m, at that time he was playing for Real Madrid. In March 2015 Beckham had the third highest social media rank in the world among sportspeople, behind Cristiano Ronaldo and Lionel Messi, with over 52 million Facebook fans.

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The druids

The unknown and unexplainable has attracted people at all times. Apparently, this is why everybody is all over the occult and magic things nowadays. And the druids and their history are among the mysteries that attract much attention. Maybe it is happening because of the growing interest in the Stonehenge. Many believe that the Stonehenge was built by druids. Despite of this rooted belief there are people who doubt the connection between the place and its nature and the druids. So who are the druids?

There are many historical sources that give us the definition of this concept. The druids are the priests of the ancient Celtic people. The first mentions of them are found in the texts dating back to IV century BC. The main sources about the druids are of Roman origin. The druids themselves didn't create any writings, all their wisdom was just passed orally from generation to generation.

The school of the druids was divided into three parts. Representatives of the lower one were called "ovates" and wore green robes. Representatives of the middle level wore sky-blue robes. They were called "bairds". For higher caste was called druids. A white robe was their distinctive sign. The main druid wore gold wreath of oak leaves. One had to try hard to become a druid. Studying for many years, exemplary behavior and initiation rite - spending some time locked in a coffin – would help to achieve the druid status. Or one could be sent into the open sea in a wooden boat all alone and without any equipment. If the applicant came back alive from this trip, this one would be considered risen again and unconditionally accepted into the ranks of druids.

The druids had their own rites. For example, there was the tradition of picking up mistletoe. This plant was valuable in their circles and used as medicine and in different spells. The chief druid would climb an oak and cut off the plant with a special gold knife, placing sheaves on a white cloth. After the process a white bull was sacrificed under this oak. Human sacrifice was not uncommon as well. Nowadays more than ten thousand Britons consider themselves the druids. Each year they gather at the Stonehenge at dawn in the summer solstice on the 21th of June to greet the sun.

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Peculiarities of the National English Cuisine (Особенности национальной английской кухни)

English cuisine is based on dishes with beef, lamb, pork, chicken and fish, with the addition of flour, butter and eggs. As a side dish to main dishes are usually served potatoes and vegetables. We cannot say that the traditional English cuisine is particularly refined - typically English dishes are simple and unpretentious. Unlike neighboring France, the food in the UK is not intended to give aesthetic pleasure, but rather performs a purely practical function - to fill the stomach.

The most typical British dishes are:

- All kinds of sandwiches (usually a sandwich of two triangular slices of bread with a filling sandwiched between them, generously flavored with mayonnaise);

- The world-famous "fish and chips" (fish fillets breaded with a garnish of French fries, seasoned with malt vinegar);

- Different types of cakes with fillings such as Cornish pie - puff pie stuffed with pieces of meat, potatoes and carrots;

- Baked meat;

- Yorkshire pudding, etc.

Some traditional English dishes have quite strange names, e.g. "Bubble and squeak". This dish is the prime example of England thrift: it is made from the remnants of the traditional Sunday lunch. On Sunday, it's common to have "the Roast" – a baked piece of meat with baked potatoes and cooked vegetables (cabbage, carrots and peas), as well as Yorkshire pudding and a traditional thick sauce with meat, known as the "Grave". All that remains of the Sunday lunch, griping

British did not throw, but cut into small pieces, pour in egg and fry in a frying pan - a traditional English dish of bubble and squeak.

What's the origin of such an unusual name? There are 2 versions: the first says that it's due to the sounds of squeak and gurgle accompanying the process of frying in a frying pan. And the other goes as follows: the essential ingredient of bubble and squeak is cabbage, thus, the process of digestion results in gurgling sounds, and then the gases produce squeaking sounds. So, be prepared to "gurgle and squeal," if you decide to try this dish.

The pride of the English cuisine is puddings - vegetable, meat, cereals and sweet fruit. The most famous is considered a festive Christmas plum pudding. It is prepared from fat, bread crumbs, flour, raisins, sugar, eggs, and various spices.

English cuisine is not too exquisite, but pays much attention to the quality of ingredients. It reflects national features such as rhythm, regularity and eternal conservatism.

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Wedding ceremony in New Zealand (Свадебная церемония в Новой Зеландии)

New Zealand is a country in eastern Polynesian settlements of Maori, who managed after many years to maintain its unique culture. A wedding ceremony plays an important role and I want to tell you about it.

In New Zealand, there is a legend about ancient ancestors of the Maori. They were two beautiful lovers, who had planted the seeds of love in the city of Rotorua. Their touching and romantic history is considered to be the Maori Bible of love.

A wedding ceremony here is a kind of rite of happiness, because Maori have long been considered to be the happiest nation in the world. In addition, Maori ceremonies are close to Christian ones, so they will not shock you with its eccentricity and originality. A wedding day usually begins with preparations for the ceremony. You and your beloved should be dressed into the national Maori traditional robes and wear jade necklaces. The ceremony usually takes place in a sacred place for the people of Maori. Before you go there, you will hear the speech of welcome, which means that you can enter.

At the entrance the bride and groom are met by a national musical ensemble, which will perform songs throughout the ceremony. Do not be afraid of the traditional Maori greeting dance. While dancing, the islanders should touch each other noses as a sign of respect and trust. Now it's time to say a few words about a Maori priest. The lovers should utter solemn vows and exchange rings. After that, the same ensemble which accompanies you will play a special hymn of love, called "Pokarekare Ana."

After the wedding ceremony, the priest necessarily gives the couple certainly symbolic gifts and blesses them for a long and happy married life. The funniest custom is a traditional touch of noses and is an important rite of passage for these fun and friendly people.

In the evening, the newlyweds, their friends and family are waited for dinner, including traditional and contemporary dishes. The banquet is accompanied by folk songs and dances. These are some interesting and unusual tradition peculiar to a wedding ceremony of Maori.

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The English language in the Netherlands (Английский язык в Нидерландах)

The English language in the Netherlands is used by between 90% and 93% of the Dutch population.

Due to the small size and population of the Netherlands, and hundreds of years of having a trade and commerce economy, particularly between mainland Europe and the United Kingdom, the Dutch put strong emphasis on learning English and other foreign languages, especially German. The Netherlands was also liberated from the Germans by English speaking troops which boosted the status of the English language. In the following decades, with American-dominated globalization, English gradually increased in importance as a lingua franca, at the expense of German and French, which both lost popularity as secondary languages in the later 20th century.

English is compulsory on all levels of the Dutch secondary education system. First, many elementary schools teach English in the upper grades. Second, a student has to score at least a 6/10 for English Language and Literature for their high school finals, otherwise they won't graduate. Third, around 100 schools offer Bilingual Education (Dutch / English), and the aim of Bilingual Education is for the students to obtain the same level of English as the native speakers of Great Britain. Fourth, the first university professor of English, Jan Beckering Vinckers, was appointed at the University of Groningen in 1885. Fifth, most university master's degrees are in English, and an increasing number of bachelor's degrees are as well, and even the first degrees of community college given in English have made their way into existence. Sixth, students are often taught to perform Internet searches in English, as the results of these obtain a far higher variety and extent of information compared to the Dutch equivalent.

Many programs on Dutch channels are broadcast in English with Dutch subtitles. English language children's programs, commercials, films, however, are usually dubbed.

However, like the residents of other countries, some Dutch people face their mistakes in English, i.e., speak Dunglish. This kind of language is a portmanteau of Dutch and English. The linguistic anglophobia, within the European Dutch language area (i.e. the Netherlands and Flanders) has evolved out of schools and companies switching to English as medium of communication and a large number of English loanwords in the Dutch language. Consequentially this has led to some anglophobia with some groups advocating the disposal of all English loanwords.

English disease is a pejorative term for the effect of the English language on the use of linguistic compounds in written Dutch. The anglicisms (and sometimes americanisms) enter the written language as a result of being exposed to English words and expressions.

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What is football? (Что такое футбол?)

The most massive and popular sport today is football. Football is a team sport in which the aim is to score the ball in the opponent's gates with legs or other parts of the body (except hands) more times than the opposing team. Each team consists of eleven players, including goalkeeper. Goalkeepers are the only players who are allowed to play with a hand, provided they do so within the penalty area at the gate.

Private game is called a football match, which in turn consists of two halves of 45 minutes. The pause between the first and second halves is of 15 minutes, during which teams are resting, but by its end change ends. If during the two halves teams have scored the same number of goals, it is fixed or draw, or the winner is revealed according to the established rules of the match. In this case, there may be assigned extra time - two more times for 15 minutes each. As a rule, between the main and extra time of the match teams are given a break. Between the extra time the team is given a time to shift sides. At one time, in football there was a rule according to which the winner is the team that is the first to score (the rule of "golden goal") or wins at the end of any of the extra period (usually the "silver goal"). At the moment, the extra time is either not played at all, or is played in full (2 halves of 15 minutes). If you fail to reveal the winner during extra time, there is a series of penalties that are not part of the match: the goal of the opposition with 11 meters distance makes its way on five hits by different players. If the number of penalty goals for both teams is equal, they punch one pair of a penalty until the winner is revealed.

Each year, there is the football World Cup. FIFA World Cup (from the Spanish Copa Mundial de Fútbol) is a major international football competition. World Championship is held by the governing body of the world football - FIFA, and to participate in it there are men's national teams of FIFA member countries from all continents.

In the entire history of the world championships only 8 countries were awarded the title of champions. The greatest number of titles on

the account is in Brazil - 5 times they have become the winners of the championship. Italy and Germany conquered the World Cup 4 times; Argentina, Uruguay became champions twice, and England, France and Spain have once won the championship.

The only person having become the world champion as a player three times is Pele (at the championships in 1958, 1962 and 1970).

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Notting Hill Carnival (Ноттинг-Хиллский карнавал)

Last August, many tourists were in London for the biggest street party in Europe, the Notting Hill Carnival. This enchanting parade was a sea of bright colors and was attended by nearly 2 million people.

The Carnival is not alien to British culture. Bartholomew Fair and Southwark Fair in the 18th century were moments of great festivity and release. There was juggling, pickpocketing, whoring, drinking, masquerade — people dressed up as the Archbishop of Canterbury and indulged in vulgar acts. It allowed people a space to free up but it was banned for moral reasons and for the anti authoritarian behavior that went on like stoning of constables. Notting Hill Carnival singlehandedly revived this tradition and is a great contribution to British cultural life.

The carnival's origins lie far away in the Caribbean. In colonial times, slaves were taken from Africa to work in the Caribbean islands. They were forbidden to play music or wear traditional clothes, so when slavery was made illegal in 1833, men and women on the island of Trinidad took to the streets in colorful costumes to celebrate their new freedom and revive their native culture. This celebration soon became an annual part of the island life and contains all the elements that can be seen at the London Carnival today: masked dancers, calypso music and bands playing steel drums.

The Carnival reached central London in the mid 20th century. Notting Hill was a very poor area then so it soon became the first stop for many Caribbean immigrants looking to settle in London. The idea of a Caribbean-style Carnival originated in 1964 and it instantly became a huge success. With the first catchy tunes from a steel band, locals immediately flooded onto the streets, appreciating the music as a community and remembering the carnivals back on the islands.

There's nothing quite like the smell of Notting Hill Carnival. We're talking about the wonderful aromas of traditional Caribbean food. The Notting Hill Carnival provides the perfect introduction to jerk chicken, rice and peas and rum punch as well as the odd taste of other exotic cuisines. In recent years, the event has been much freer from serious trouble, and is generally viewed very positively by the authorities as a dynamic celebration of London's multicultural diversity, though dominated by the Caribbean culture. The Carnival has been held in Notting Hill ever since and has grown into the phenomenon. Despite becoming a highly profitable event with vast numbers of dancers and fierce musical competitions, the Carnival carefully maintains its Caribbean roots. It remains one of the most important celebrations of cultural diversity and understanding in Europe.

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Sprachliche und kulturelle Beziehungen zwischen Russland und Deutschland

(Культурные и языковые отношения России и Германии)

Die deutsche Sprache – ist die drittwichtigste Landessprache Europas. Sie ist Muttersprache in Deutschland, Österreich, Schweiz, Lichtenstein und Luxemburg. Der Hauptgrund der Popularität des Deutschen in Europa ist die Wirtschaftsstärke Deutschlands und deren Bedeutung für die Europäische Union. Aber nicht nur das macht Deutschland zu einem weltweit einflußreichen Staat. Deutsche Kultur hat historisch gesehen eine viel wichtigere Bedeutung. Deutsche Sprache hat von allen germanischen Sprachen die engsten Beziehungen zu slavischen Sprachen beibehalten. Seit Frühmittelalter leben Deutsche und Slaven dicht beieinander und durcheinander. Viele Ortsnamen im Osten Deutschlands erinnern uns heute noch an diese Zeiten. Lipezk (von "lipa"= Linde) wurde zu Leipzig, Branibor (Schlacht+ Wald, erobert 789 von Karl dem Großen) wurde zu Brandenburg, Dresden entstand aus "Drežd'ane" usw. Natürliche Folge dieser Prozesse, die sich leider nicht immer friedlich entwickelten, war eine beiderseitige

kulturelle und sprachliche Bereicherung. Somit sind deutsche und slavische/russische Kulturen nicht aus der Kultur Europas wegzudenken.

Besonders aktiv entwickelten sich kulturelle und sprachliche Beziehungen zwischen Deutschen und Russen seit der Zeit Peter des Ersten. Für viele Deutsche wurde Russland neue Heimat, so daß sie sich von da an russische Deutsche nannten und viele russische Wörter, manchmal sogar Bräuche, übernommen haben. Auch die Russen haben von Deutschen viel übernommen: Bekleidungsmode, Baumuster, Wortschatz. Besonders viele Lehnwörter stammen aus den Gebieten der Politik und Technik wie герцог, граф, канцлер, солдат, блицкриг, лозунг, фельдшер, шпион, циферблат, шлагбаум, штаб, масштаб, рейсмас, рейсфедер, циркуль, штрих, абзац, аншлаг, вундеркинд, бутерброд und viele andere. Es gibt zwar einen Unterschied: die genannten deutschen Wörter gehören seit den Zeiten zum festen Bestandteil des russischen Wortschatzes. Die meisten russischen Wörter blieben nur in der Sprache der Rußlandsdeutschen, in Deutschland waren sie unbekannt. Die zweite Welle der Entlehnung aus dem Russischen, diesmal ins Deutschlandsdeutsch (aber auch in andere Sprachen) begann nach der Oktoberrevolution. Seit dem Start des ersten künstlichen Erdsatelliten (Sputnik) begann eine dritte Etappe der Entlehnungen aus dem Russischen.

Das alles zeugt von den langjährigen engen Beziehungen zwischen Deutschland und Rußland und zugleich von der historisch führender Rolle deutsch-russischer Beziehungen für beide Länder und in politischer Hinsicht sogar mehr: für Europa und die Welt.

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Hip-hop culture (Хип-хоп культура)

The history of hip-hop originated in the late 60s of the 20th century and continues to evolve to this day. Hip hop culture originated in New York among black and Latin ghettos. Street culture existed for centuries in all countries. But in the US, where there are ghettos, it had a special isolation from society. And here it spilled onto the streets of white quarters and then to the masses - the show-business, discos, cinema, etc.

Hip hop culture has been internationally recognized since the 70s. Its main components are rap (MCing), break-dance, graffiti, street types of sports games.

Clive Campbell from the South Bronx known as Kool Herc is considered to be one of the founders of hip-hop.

Hip-hop culture represented a politically motivated alternative to crime and violence. Hip-hop dance battle held the children and youth of new York from drugs, alcohol, and street violence since break-dance required a healthy lifestyle. Hip-hop improved the crime situation in the neighborhoods of New York. Music and dance truly are a universal means to overcome barriers between people!

Hip hop dance can be divided into two basic types: old school and new style. Old school includes popping, locking, breakdance. Popping in turn is divided into boogaloo, electric boogaloo, tetris, waiving, robot, egypcian, popcorn. The style "locking" has become a stage standard for many black singers and MTV stars such as Janet Jackson and her dancers, as well as many others who move in this style.

Basic elements of this style are the "quality" of the body, jumping, falling, rotation and light acrobatic movements. It is a very dynamic dance style that combines the emphasis on individual body parts (head, arms and legs) and the elements of movements from everyday life. And yet it can be characterized by softness, ostentatious complacency, swagger sometimes. Hip-hop is currently the world's leading dance direction of Western and Russian dance culture and pop music, this style of contemporary dance has gained immense popularity all over the world.

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Architecture of Great Britain

The architecture of Great Britain is represented by variety of architectural styles. The British architectural history begins with the first Anglo-Saxon Christian church constructed soon after Augustine Canterbury's arrival in Great Britain in 597. Augustine founded the cathedral and dedicated it to Jesus Christ, the Holy Saviour.

The gothic style of England existed till 16 century. The cathedral of Westminster Abbey in London — the place of coronation, marriage and burial of all English monarchs since the time of William the Conqueror — is close to samples of the French gothic style.

Baroque in England had limited nature and not long existence. Positions were taken by classicism. The new tradition was based by the architect Inigo Jones (1573 — 1652). The best-known monuments of the time: Wren Library, the Chapel (Pembroke College), the Chapel of Emmanuel College. After industrial revolution the character of many British cities changed. The country of rural estates, oak groves with mills, ponds turned into the country of metallurgical plants, factories, docks — industrial landscapes and the smoke-filled cities. Not architects, but rational engineers began to form architectural appearance of the country. But the main part of constructions of the colonial empire was still built in classicism stylistics — dry, bulky (St George's Hall in Liverpool, the British Museum in London).

The Queen Victoria's era was characterized by neogothic style. In 19 century the British Empire won the first place in the world of trade and decided to organize the First World Fair in London. For this purpose the special palace pavilion was created. The showroom of more than 90 000 m² could accept 14 000 visitors and it was named "The crystal palace". Not the architect, but the greenhouses engineer Joseph Paxton was the author of the construction. The plan of the palace and its architecture were primitive, but surprised with use of new materials — iron and glass as filling of walls and roofs. Later the Palace was destructed.

The modernism came to the stage before World War I from continental Europe. It was said that many design decisions were dictated by the cost of projects; however, also new currents appeared. In the style are Hayward Gallery and the building of Royal National Theater are constructed.

High-Tech architecture was an attempt to recover modernism language, deriving inspiration from technologies for creation of new architectural expression. The hi-tech architecture is generally connected with nature of technological figurativeness – the Lloyd's building (London) – the home of insurance institution.

We should mention the most well-known construction — the ritual Stonehenge complex. The structure is a circle of 30 upright stones, some of which are still linked by lintel stones on top (in the county of Wiltshire) in 130 kilometers to the southwest of London. Stone Stonehenge had small and wooden predecessors which we can't see now. The modern complex is protected, and the unique construction remains a subject of discussions, scientific researches.

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Герасименко Елизавета, Мирзаматов Радмир

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Monsters' Park (Парк чудовищ)

A very unusual Park in Italy is located in the city of Bomarzo in Italy. It was created by Prince Pier Francesco Orsini in the 16th century. He began the construction of the Park in 1553. The idea of its creating belonged exclusively to the Prince and well-known architects J. Barazi and P. Ligorio helped him. Francesco Orsini built a garden in memory of his wife Giulia Farnese, who died in accident during the construction of the Orsini castle, when the Prince was on a military campaign in 1546.

The name of Sacro Bosco in Italia can be translated as a beautiful forest, which is filled with mythological characters. Orsini called it a «Garden of rarities». At the entrance, you are met by the Head of Proteus, son of Neptune, which symbolizes the power of the Orsini over the world. Next, a huge statue clash of the Titans is seen. Besides, you can see here Hercules breaking Kukosa, an elephant devouring a man, the dogs who attacked the dragon. Stone grotto is the head of Orko, Queen of the Underworld. The mouth is the entrance and the tongue is a table. This mouth has the amazing property: any sound uttered here is heard all over the Park. A very unusual building in the Park is falling two-story house, as if it loses orientation in the space. Some historians say that originally the house was not sloped, and has become so because of a landslide. The Park became overgrown and has a sinister look now. There are legends about evil spirits that live in these places. The Park of Bomarzo was called Park of the mosters.

Nowadays the owner of the Park is Giovanni Bettini, which is engaged in landscape design. He restored and opened the Park. The most part of the Park was renovated thanks to his wife, Tina Bettini. Now the Park has regained its past fame. Salvador Dali was interested in Quaint stone menagerie Sacro Bosco.

We can have different attitudes to the Park in Bomarzo, but one thing is certain: Frank Orsini, who was an extraordinary remarkable man of his time, created it. Now his work remains like no other, original and memorable. The Park holding many secrets for us will forever remain unsolved...

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Гимазетдинов Вазир

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Christmas in Britain (Рождество в Британии)

Christmas is Britain's most popular holiday. Its traditions and early ceremonies were rooted in pagan beliefs and date back hundreds of years. They are still part of contemporary Christmas celebrations.

The Druids, for example, honoured the mistletoe in their religion and sacrificial rites. The red berry of the holly was believed to protect one against witchcraft. Ivy symbolised immortality. The Vikings introduced the Yule log which used to be burnt in honour of God Thor. The English adapted this practice for Christmas and today's (electric) Christmas candle is a holdover from baronial days.

The custom of sending Christmas cards to friends and family originated in Britain, too. In 1843 John Calcott Horsley designed the first one for Sir Henry Cole. Thus began a real spread of sending Christmas cards and this practice soon became an established tradition. Favoured designs were Christmas feasts, church bells, plum and turkey as well as religious themes. Every year more than a billion Christmas cards are now sent in the United Kingdom. Many of them are sold in aid for charities.

Since 1840 the decorated and illuminated Christmas tree has gained popularity in England. Prince Albert brought this rite over from Germany. In 1848 the Illustrated London News published a picture of the Royal Family around one. The English families followed the Royal example and it can truly be called a Victorian innovation. Each year a giant Christmas tree is set up and decorated near the statue of Lord Nelson in Trafalgar Square. It commemorates Anglo-Norwegian cooperation during World War II.

On Christmas Eve carols are often sung by groups of singers walking from house to house, and children hang a stocking on the fireplace or at the foot of their bed for Father Christmas to fill. Caroling dates back to the Middle Ages when beggars were seeking for money, food or drink wandering the streets singing holiday songs.

On Christmas Day gifts are opened in the morning. Later the family will gather for the traditional Christmas dinner consisting of Brussels sprouts, fried potatoes with roast turkey, roast beef or goose. Sweet mince pie or Christmas pudding is served for dessert.

The pudding might contain coins or lucky charms for children. For afternoon tea Christmas cake is offered. It is rich baked fruit cake with marzipan and icing. A party favourite are Christmas crackers. There will be one to each plate on the Christmas dinner table. A Christmas cracker is a brightly coloured paper tube, twisted on both ends and filled with a party hat, a riddle and a toy. The annual broadcasting of the Queen's Christmas Message is on Christmas Day afternoon. In 1932 King George brought this custom into being.

Boxing Day is on December 26th. This day takes its name from a former custom giving a Christmas box to delivery men and trades people called regularly through the year. Nowadays dustmen, milkmen, or postmen get a tip for a good service at Christmas time.

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Online booking in tourism industry (Онлайн-бронирование в туристской индустрии)

Nowadays electronic technologies have conquered tour companies. The Internet has influenced the development of the touristic business in all countries all over the world. The systems of online booking and reserving are on the higher stage of the touristic market, being one of the most influencing sectors.

In today's market of tourist services Global Distribution System provide fast and convenient ticket booking, reservation hotels, car rental, value exchange, booking entertaining or sport programs, etc.

The most common Global Distribution Systems are: Amadeus, Galileo, Sabre, Worldspan, Abacus. There are some domestic reservation systems in Russia. They are "The Siren", "The Key", "SAMOsoft".

The advantages of such systems are obvious: practically full automation of all the business operations, minimization of negative consequences due to the Human factor (for example, someone's forgotten sending fax and so on), sending information the tour agencies (prices, flights loading, etc.).

Operational communication between modern touristic agencies takes a great part in their activity. Speed of information is of paramount

importance. Using the tools of the online booking and reserving eases the tour firms' activity a lot.

It should be noted that many large tour operators encourage reservation on the Internet and as a reward rise the percent of commission remuneration. Reserving online has many advantages. The main one is the real reflection of having or not having any kind of services. Besides, processing the internet application takes less time.

Thus, without multilateral computer software it is impossible to make functioning of the touristic company successful. However, the high cost of the development, the absence of the business operations which demand upgrading the system from time to time, all of that slows the wider spread of these systems.

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British Art, Theatre, Music (Британское искусство, театр, музыка)

There was little pictorial art in England until the great miniaturists of the Tudor epoch. There were portraits on a large scale, but they were in the main, of foreign origin, notably Dutch like Holbein. Then came Hogarth, the first great native painter born at the end of the 17th century, famous for both engravings and oil paintings, he was followed by Joshua Reynolds (1723-1792) famous for his portraits.

If Hogarth was the artist of the towns, Gainsborough, contemporary of Reynolds, was the painter of the countryside, frequently the background to his portraits. In a similar tradition was Stubbs, as famous for his portraits of horses as of people.

Among the other portraitists of the 18th century were Romney, and Rae-burn. Constable (1776-1837) finally gave landscape painting its importance. Among his near-contemporaries, though a little younger, were William Blake, poet, visionary and painter, and Turner, renowned above all for his naval scenes.

The modern period in British art may be said to date from the year 1910, when the first Post-Impressionist Exhibition was held in London.

The first decade of the century had been dominated by two romanticists, Frank Brangwyn and Augustus John and by the sculptor Jacob Epstein who became a protagonist of modernity. The two painters may, to some extent, have been influenced by Gauguin, Epstein was essentially an expressionist.

Such modern painters as Peter Blake, Allan Jones and some others seek an image of immediate popular appeal (hence the term "popart" sometimes applied to this school).

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The United Kingdom of Great Britain and Northern Ireland (Соединенное Королевство Великобритании и Северной Ирландии)

Great Britain lies on the Atlantic coast of Western Europe, separated from France by only 34 km (21 miles) of water. It is made up of three countries, England, Scotland and Wales. Great Britain with Northern Ireland forms the United Kingdom of Great Britain and Northern Ireland. The capital of the United Kingdom is London, in England. The capital of Wales is Cardiff, and the Scottish capital is at Edinburgh.

Although a small island, Great Britain has a remarkable variety of landscapes. To the north and west are highlands- the mountains of Scotland, Cumbria and Wales, and the Pennine Chain. To the east are flat plains, and in the south are lowlands broken by low ranges of hills. To the Southwest are the bleak moors of Devon and Cornwall.

A warm ocean current, the Gulf Stream, washes Britain's western shores. This water heats up and cools down very slowly. Britain therefore enjoys warmer winters and cooler summers than other counties at the same latitude. The west of the island has a higher rainfall and slightly milder climate than the east.

Britain has been many centuries in the making. The Romans conquered Britain, but were unable to subdue the independent tribes in the west and the north. Other invaders were Angles, Saxons, Jutes, Vikings and Normans. England waged numerous colonial wars and was the empire for many centuries. England was the first country were capitalism was established.

Great Britain is a highly developed industrial country. It is known as one the largest producers and exporters of machinery, electronics, textile, aircraft and navigation equipment. One of the chief industries of the country is shipbuilding.

The UK is a constitutional monarchy. The powers of the British Queen are limited by the Parliament. The British Parliament consists of the sovereign, the House of Lords and the House of Commons.

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Russian and UK's traditions (Традиции России и Великобритании)

Traditions are a part of the culture of any country. In order to better understand other people, it is important to get acquainted with their history and culture. Of course, there are common features that characterize one or another nation. United Kingdom is a relatively small island with an interesting variety of regions, which carefully guard their national traditions. Adherence to the British tradition is shown not only in politics, but also in an ordinary life.

England has a tradition to give modest but high quality gifts or any handmade touching things. Some traditions of England and Russia are similar, but not the same.For example, significantly different is the
tea drinking tradition: the British tradition was born in the XVI century; with the help of the British tea they still plan their day, in Russia tea appeared later in the XVII century and since then this tradition has changed dramatically. Also Britishpeople love to beat home. They say, «My house - my fortress» (My house is my castle), because they do not want other people to know what is happening at home. The British prefer to live in separate houses built for one family. The Center of the House is a fireplace around whichall family memberssit and look at the fire, exchanging news of the day. Russians love their homes, but usually they live in flats and they love to invite people to visit or visit someone themselves, because they are more hospitable than the British. Russian people are more open and are often interested in the affairs of their neighbors.Modern traditions in the UK are very bright, cheerful, happy and colorful.Culture and traditions of England and Russia differ significantly. This is due to the geographical location of the countries, their history and climate. England -is a very small country, surrounded by the seas. This means that the climate is humid. The weather is often wet, overcast, so the English often drink tea. Russia is a huge country. The climate in our country is not so crude. History of English and Russian people is also very different from each other.

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Fandom's life (Жизнь фэндома)

Today there are numerous fascinating movies, books, TV series, video games to anyone's taste. But for me it is vitally important to express my emotions and find like-minded people on the Internet. So if you have watched the most amazing movie or read a book that has changed your mind completely, don't hesitate to join a *fandom*.

Fandom is a group of fans of any creative work (a book, a movie, a video game, etc.) who discuss it, draw images based on it, and write

fanfiction. Fandom unites very creative and talented people who rethink the creative work and feel inspired to create something too.

Fandoms, as we know them, have started since the Internet became more common in our lives. But if we take a retrospective look, we will realize that fandoms's origin dates back to earlier times. In the 1890s when Conan Doyle wrote «The Adventure of the Final Problem» about the most genius detective of all the times Sherlock Holmes, his readers demanded the sequel and began to write themselves. It was nothing else but a fandom.

So, fandom can create fan arts (images), fanfiction, vids (fanvideos) etc.

Fanfiction (fics, fanfic) is fiction based on some work which uses the same universe (it's called *the canon universe*) and the same characters. Author can take some characters from one universe and bring them into the real world. This fic will be called *the alternative universe*. But if you want to mix two or more fandoms it will be the *crossover*.

To write fanfiction you need to know some rules. For convenience sake fandoms make a header. The header consists of the fandom, the author's name, genre, rating and pairing.

Rating must be familiar to most people, because fandoms take it from movies. Fanfiction uses ratings G (general audiences), T (for teenagers with parents' permission), E (explicit: for adults only).

Pairing is a central couple whose relationships are described. Pairing is not necessarily a canon couple. It can be two characters whose interaction you really like. For example, the Tenth Doctor and Rose («Doctor Who» series by BBC), Harry Potter and Ginny Weasley.

OTP (one true pairing) is a couple who you think must fall in love. *BrOTP* is a bromance. It means that two characters are the best friends and look like true brothers. For example, Arthur and Merlin («Merlin» series by BBC), captain Kirk and Spoke («Star Trek»).

Fandoms hold various events and competitions: OTP-wars where fandoms are divided into teams and create various art works, Secret Santa and others.

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The Lincoln Castle (Замок Линкольн)

The Lincoln Castle is almost a thousand years old. It was built simultaneously with the Lincoln Cathedral: the two England attractions which are located opposite each other.

Lincoln Castle dates back to 1068: it was founded on the order of the Duke of Normandy William the Conqueror, who conquered Britain in 1066. The fortress was built on the fragments of earlier Roman fortifications on the hill in Lincoln. By the standards of that time it was a large, commercial, densely populated city: for the construction of the castle and the entrance to it they had to destroy more than two hundred houses of local residents. It was intended to protect the city and maintain the important trade routes. The bailey has a square shape and the castle itself is enclosed by a dry moat. Later, the wooden buildings were replaced by stone and the castle was expanded. At first it was the possession of the British Crown, and later its masters were the noble counts of Salisbury, Lincoln and Lancaster.

Lincoln Castle includes walls, courthouses and prisons, residential buildings and four big towers, two of which are located on the artificial mounds. One - Tower Lucy (polygonal donjon) dates back to the XII century, the other - observation tower standing on the smaller mound - XIV. Tourists can walk through the former prison dungeons with the appropriate interior, where people holograms appear instead of dummies.

One of the rooms has one of the four surviving copies of the Magna Carta. The document was signed by King John in 1215 and became one of the main constitutional acts of England.

The fragments of the walls and the arch, built in the Roman period (I century) are the tourist's attraction in the city of Lincoln. The most popular castles in England are the Windsor, Caernarvon, Conway, Leeds and Beau Maris.

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Canadian Culture and Traditions (Канадские культуры и традиции)

Canada is known worldwide as a multicultural country with a vast range of cultural influences that create its distinct range of customs and traditions. Proud for their unique identity, Canadians stick out like a thumb in any country they visit, as they take pride in being citizens of the world's 2nd largest country in terms of total area.

Canadian culture is heavily influenced by its conquerors - the French and the British. Add these influences with the country's indigenous cultures, and you've got the distinct Canadian identity.

With a large number of immigrants, there are many regions in the country with different adaptations of the different nationalities that have called Canada home. This has resulted to a diverse and multicultural nation that has made Canada a welcoming country - welcoming of any religion and any nationality - making it a favorite place to migrate to by individuals from different countries all over the world. The local customs and traditions in Canada were brought to the country by the millions of immigrants and were part of the native culture when these people arrived. One of the traditions that Canada shares with the US is the celebration of Thanksgiving. This is a holiday in the country that is held on the first Monday in October. The early settlers were so pleased with their first harvests in the new land that they had a celebration to give thanks. This tradition continues today.

When you visit someone's home, you always remove your footwear inside the entrance. This is so you won't track any mud or gravel onto the clean floors of the house. On Halloween, children dress up in all kinds of costumes and go from house to house in their neighborhood receiving treats of candy. During the Christmas season, mummering is a tradition in Newfoundland. Both children and adults dress up in old mismatched clothing and cover their faces. They visit homes and put off a sort of mini-concert by singing and dancing. Each area of the country and each ethnic group have their own tradition and custom. This makes it very difficult to determine one or several customs that are practiced in the same way all across the country. November 11 and July 1 are two days in which the Armed Forces are honored. The first long weekend of the year takes place in May – on or near May 24 in honor of Queen Victoria's Birthday. Bonfire night on November 5 is still held in some parts of the country to celebrate Guy Fawke's Night.

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British Royal Family (Британская королевская семья)

The United Kingdom is a parliamentary monarchy. This means that it has a monarch (a king or a queen) as its Head of State. The monarch reigns with the support of parliament. The powers of the monarch are not defined precisely. Everything today is done in the Queen's name.

At present the British royal family is headed by Queen Elizabeth. When the Queen was born on the 21st of April 1926, her grandfather, King George V, was on the throne and her uncle was his heir. The death of her grandfather and the abdication of her uncle brought her father to the throne as King George VI. As a child she studied constitutional history and law as well as art and music. In addition she learned to ride and acquired her enthusiasm for horses. As she grew older she began to take part in public life, making her first broadcast at the age of 14.

The marriage of the young Princess Elizabeth to Philip, Duke of Edinburgh took place in November 1947. She came to the throne after her father's death in 1952 and was crowned in Westminster Abbey in June 1953. Among Queen Elizabeth's many duties are the regular visits to foreign countries and especially those of the Commonwealth whose interests and welfare are very important to her. She also started the tra-

dition of the "walkabout", an informal feature of a royal visit, when she walks among the public crowds and stops to talk to some people.

The Queen's husband Prince Philip, Duke of Edinburgh, is 94 years old. He is the longest ever serving Royal Consort and oldest serving spouse of a reigning British monarch.

Her eldest son Prince Charles will be 66 years old on and is the longest waiting and oldest ever heir to the throne. On 29th April 2011 the Queen's grandson Prince William who is the 2nd in line to the throne, married Catherine Middleton in Westminster Abbey. They are now the Duke and Duchess of Cambridge. They have a son and a daughter who are the 3rd and the 4th in Line of Succession to the throne.

Prince Henry, the second son of Prince Charles and Princess Diana is now a qualified Apache helicopter pilot. In March 2015 it was announced that he will leave the Army in June following a detachment with the Australian Defense Force.

The Queen's other children are Princess Anne, Prince Andrew and Prince Edward. In recent years they have become quite popular with the general public.

Debate about the future of the monarchy continues, but the Royal Family has shown itself willing to accept evolutionary change including the Queen's decision to pay tax, changes being made to the Civil List, and the opening of Buckingham Palace to the public to help fund the restoration of Windsor Castle. Queen Elizabeth II became the longest ever reigning British monarch surpassing the 63 years 7 months reigned by her great-great-grandmother Queen Victoria.

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Global Warming (Глобальное потепление)

Global warming has become a serious problem in modern world. It is referred to potential changes in climate, which can lead to the rise of global temperature. In December 1995, climatologists from the United Nations' Intergovernmental Panel on Climate Change (IPCC) all agreed that global warming is an undeniable fact. For example, over the past 100 years the average temperature rise was about 1 degree.

According to some scientists, global warming is the result of the industrial revolution. If it continues, it can destroy our civilization. One of the most important reasons of global warming is the air pollution. More and more factories are being built in different countries. By burning oil, coal, gasoline, even natural gas, they add more carbon dioxide to the atmosphere. Cars also influence the atmosphere badly by burning many liters of oil and releasing harmful gases into the air. As a result, the ozone layer of our Earth is being destroyed. All these activities unfavourably change the Earth's heat balance.

In a warmer world, extremes of wet and dry will intensify. In very dry regions where there is little water anyway, an increase desertification – especially in the interiors of continents the rainfall will become very rare. In areas where high levels of rainfall are normal, increased water vapour, and hence fiercer rainfall, should be expected.

As a result of this, insurance companies are panicking. Many are trying to persuade governments to regulate emissions of greenhouse gases.

However, not all of the reasons that cause global warming are of human nature. Natural phenomena such as solar variation combined with volcanoes probably had a small warming effect.

Warmer weather is likely to increase the amount of algae in reservoirs and lakes. This will make water treatment and purification more difficult and there will probably be an increase in stomach-and intestine-related illnesses. Global warming could also affect human health, harm wildlife and damage ecosystems. Warming may enhance air pollution, particularly in urban centers, increasing the incidence of respiratory diseases. Asthma and allergic disorders result from climate changes too. Health risks can be solved through various scientific strategies, which may include improved and extended medical care services, better housing and air conditioning, water purification and public education. The next way out would be to stop using fuel and start exploiting alternative natural resources like water, solar and wind power that may provide us with the necessary amount of energy. We all have to remember that this planet is our home. It gives us so many resources to live on so we have to take care of it as well.

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Slang in Modern English (Сленг в современном английском языке)

Slang consists of a lexicon of non-standard words and phrases in a given language. Use of these words and phrases is typically associated with the subversion of a standard variety (such as Standard English) and is likely to be interpreted by listeners as implying particular attitudes on the part of the speaker. In some contexts a speaker's selection of slang words or phrases may convey prestige, indicating group membership or distinguishing group members from those who are not a part of the group. Few linguists have endeavored to clearly define what constitutes slang. Some suppose that, it lowers, "the dignity of formal or serious speech or writing", e.g:

cool — smart	egghead = smart
to bless you – be healthy (after sneezing)	so $long = goodbye$
dreamboat= beautiful	dumb bunny = scapegoat
lowdown = truth	back out $=$ do not keep the

At present slang abbreviations are commonly used in everyday life, an abbreviation is a shortened form of a word or phrase. It consists of a group of letters taken from the word or phrase.

u = you	$\mathbf{y} = \mathbf{w}\mathbf{h}\mathbf{y}$
$\mathbf{r} = \mathbf{are}$	8 = ate
c = see	2 = two/to/too
4 = for	

More and more abbreviations appear every day in our life and language, some of them are often used in writing messages (SMS language)

ICQ = I seek you	lol = laugh out loud
icu = I see you	brb = be right back.
i4cu = I foresee you	omg = oh my god
sk8 = skate	24u = question for you
y u no? = why you no (why don't you)	? ttyl = talk to you later
plz = please	tmi = too much information
18r = later	idk = I don't know

Often, distinct subcultures will create slang that members will use in order to associate themselves with the group, or to delineate outsiders. Slang terms are often known only within a clique or in group. Slang is usually associated with a particular group and plays a role in constructing our identities. While slang outlines social space, attitudes about slang partly construct group identity and identify individuals as members of groups. It can be said that a slang term can be a secondorder index to this particular group. Employing a slang term, however, can also give an individual the qualities associated with the term's group of origin, whether or not the individual is actually trying to identify as a member of the group.

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The British Parliament (Парламент Великобритании)

The British Parliament is the oldest in the world. It appeared in the 12th century as the body of wise counsellors whom the King needed to consult pursuing his policy. The British Parliament consists of the House of Lords and the House of Commons and the Queen as its head. The House of Commons plays the major role in law-making. It consists of Members of Parliament. Each of them represents an area in England, Scotland, Wales and Ireland. MPs are elected either at a general election or at a by-election following the death or retirement. Parliamentary elections are held every 5 years and it is the Prime Minister who decides on the exact day of the election. The minimum voting age is 18. The voting is taken by the secret ballot. The election campaign lasts about 3 weeks. The British parliamentary system depends on political parties.

The party which wins the majority of seats forms the government and its leader usually becomes the Prime Minister. The Prime Minister chooses about 20 MPs from his party to become the cabinet of ministers. Each minister is responsible for a particular area in the government. The second largest party becomes the official opposition with its own leader and "the shadow cabinet". The leader of the opposition is a recognized post in the House of Commons. The parliament and the monarch have different roles in the government and they only meet together on symbolic occasions, such as coronation of a new monarch or the opening of the parliament.

In reality, the House of Commons is the one of three which has true power. The House of Commons is made up of six hundred and fifty elected members, it is presided over by the speaker, a member acceptable to the whole house. MPs sit on two sides of the hall, one side for the governing party and the other for the opposition. The first 2 rows of seats are occupied by the leading members of both parties. Each session of the House of Commons lasts for 160-175 days. Parliament has intervals during its work. MPs are paid for their parliamentary work and have to attend the sittings. The House of Commons plays the major role in law making. The procedure is the following: a proposed law has to go through three stages in order to become an act of parliament; these are called "readings".

When the bill passes through the House of Commons, it is sent to the House of Lords for discussion, when the Lords pass the bill, it is taken to the Queen for royal assent, when the Queen sings the bill, it becomes act of the Parliament and the Law of the Land. The House of Lords has more than 1000 members, but only about 250 take an active part in the work. Members of this Upper House are not elected, they sit there because of their rank, and the chairman of the House of Lords is the Lord Chancellor. And he sits on a special seat, called "Wool Sack".

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The Irish unusual traditions and holidays (Ирландские необычные традиции и праздники)

Ireland has got rich ancient culture with customs, national traditions and unusual holidays. The examples of those traditions are fairs with folk dances and music and juggler performances in the squares. Throughout towns and villages people light huge bonfires, let off magnificent fireworks. It has been a law for about three hundred years that all the theatres are closed on Sundays. In Ireland there are also many interesting and peculiar holidays: - Saint Stephen's Day is the Day of Saint Stefan. It is celebrated on the 26-th of December. Irish boys put on suits of chimney sweeps, smear their faces with soot and raise money for charity. - Good Friday is a Catholic religious holiday when people remember sufferings and Jesus' death. This day church services are held, shops don't sell alcohol. It is forbidden to work that day. - La Lunassa – Lugnassad is an early autumn holiday. It is accepted to light fires on hills, to bake bread and traditional bilberry pie. In Ireland main and the most important holiday is the St. Patrick's Day. It is celebrated annually on the 17-th of March. Saint Patrick is considered to be the protector of Ireland. It is a holiday of early spring. The St. Patrick's Day has pagan motives. One of its main characters is a leprechaun, that is owning the hidden pot with gold. If a successful seeker of treasures manages to catch a leprechaun, then this being has to tell the person where his treasures are hidden. On this holiday Irish people are wearing red wigs and green colored clothes, go for parade and take pots with a clover. According to the legend, Saint Patrick used a three-leaved clover to explain to the Irish pagan people the meaning of the Holy Trinity. Ireland is a peculiar country with ancient history and rich culture. As long as Ireland exists as long its people try to keep and preserve the culture of the country.

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THE BEATLES

The Beatles were an English rock band, formed in Liverpool in 1960, and one of the most commercially successful and critically acclaimed acts in the history of popular music. The group's best-known lineup consisted of John Lennon, Paul McCartney, George Harrison and Ringo Starr. Rooted in skiffle and 1950s rock and roll, the group later worked in many genres ranging from pop ballads to psychedelic rock, often incorporating classical and other elements in innovative ways. Their enormous popularity first emerged as "Beatlemania"; as their songwriting grew in sophistication, by the late 1960s they came to be perceived by many fans and cultural observers as an embodiment of the ideals shared by the era's sociocultural revolutions.

A five-piece line-up of Lennon, McCartney and Harrison on guitar and vocals, with Stuart Sutcliffe (bass) and Pete Best (drums), the band built their reputation playing clubs in Liverpool and Hamburg over a three-year period from 1960. Sutcliffe left the group in 1961, and Best was replaced by Starr the following year. Moulded into a professional act by manager Brian Epstein, their musical potential was enhanced by the creativity of producer George Martin. They gained popularity in the United Kingdom after their first single, "Love Me Do", became a modest hit in late 1962, and they acquired the nickname the "Fab Four" as Beatlemania grew in Britain over the following year. From 1966 they produced what many critics consider to be some of their finest material, including the innovative and widely influential albums out in 1966, 1967, 1968, 1969. After their break-up in 1970, the ex-Beatles each found success in individual musical careers. Lennon was murdered in 1980, and Harrison died of cancer in 2001. McCartney and Starr remain active.

The Beatles are the best-selling band or musical act in history, with estimated sales of over one billion units. They have sold more albums in the US than any other artist, and in 2008 they topped Billboard magazine's list of the all-time most successful Hot 100 artists. They

have received 7 Grammy Awards from the American National Academy of Recording Arts and Sciences and 15 Ivor Novello Awards from the British Academy of Songwriters, Composers and Authors. They were collectively included in Time magazine's compilation of the 20th century's 100 most influential people.

The Beatles' influence on popular culture was – and remains – immense. Their musical innovations, as well as their commercial success, inspired musicians worldwide. The Beatles changed the way people listened to popular music and experience its role in their lives.

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Personality of Muhammad Ali (Личность Мухаммеда Али)

Muhammad Ali is an American professional boxer in heavy weight. He is one of the most famous and recognizable fighters in the world. He was and is still an influential person in and out of the ring. Muhammad is a public person; he protects the rights of the black and is against racial inequality, because he grew up in the time of racial discrimination. He takes part in organization of sport clubs for youth. Muhammad helps the young to find the way to healthy and "right" life, because many of them had to do with drugs and crime. Mike Tyson was one of them. Thanks to Muhammad Ali he began his boxing career and forgot his former criminal life.

Ali brought his unique style of boxing to the boxing world (with holding his hands low) and it seemed as if he was dancing during the ring. One of Ali's greatest tricks was to make opponents overcommit by pulling straight backward from punches. Some boxing experts even said that he ruined a whole generation of boxers, and many would like to copy him, but no one could do it.

There were many films about Ali. One of them won Oscar in 1996: "When we were kings" – documentary film directed by Leon Gast.

Muhammad Ali has also a literary talent: he wrote "The soul of a Butterfly" – the autobiography. Many writers would admire his style and language. In Internet you can find his famous quotations. My favorite one is "I hated every minute of training, but I said, "Don't quit. Suffer now and live the rest of your life as a champion".

In 2002, for his contributions to the entertainment industry, Ali was honored with a star on the Hollywood Walk of Fame. His star is the only one to be mounted on a vertical surface, out of deference to his request that his name not be walked upon. Ali could make the "white" Americans respect the "black" Afro-Americans. He proved this with all his fights and victories even when he was "too old and weak" for it. Several years ago doctors diagnosed Parkinson's Disease, a motor-skills sickness. But Ali never gives up. He fights... In 1996 he was chosen to inflame the ceremonial fire at the Summer Olympics in Atlanta.

Summing up, I want to say that we should not forget the living legend - Muhammad Ali, as he made an enormous contribution to the world community. Let us honor the heroes!

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Sporttourismus oder Extremsport? (Спортивный туризм или экстремальный спорт?)

Die Entwicklung des Tourismus führte zur Entstehung verschiedener seinen Arten. Das sind z.B. Alleinwanderungen, allerlei Wanderungen, wenn man zu bestimmten Hindernissen gefahren wird. Das Ziel einer Wanderung ist gewöhnlich die Ausarbeitung und Ableistung einer Touristenroute. Die Hauptidee ist: Man muss eine Wanderung mit Zeitund Kosteneinsparung gestalten, die Kompliziertheit der Route muss sich mit Besichtigungen von interessanten Orten verbinden, das alles soll moralische, psychologische und ethische Menscheneigenschaften stärken. In der letzten Zeit aber entstanden pseudotouristische Veranstaltungen. Dazu gehören Nachtswanderungen, Touristenwettbewerb, wo der Umgang mit dem Touristenzeug höher als moralische, psychologische und ethische Eigenschaften des Menschen geschätzt wird. Die Einführung von Rankinglisten im Wassertourismus führt zum Beispiel dazu, dass die Grundeigenschaften des Touristen nicht mehr beachtet werden.

Der Tourismus war immer Erholung von der Arbeit. Die Natur bleibt immer Erholungsgebiet für den Menschen. Es ist viel wichtiger, sich in der Natur aufzulösen, die Schulter des Freundes zu spüren, mit sich selbst ins reine zu kommen. Für einen einfachen Menschen sind Grafiken und Punkte für den Wettbewerb schwer zu verstehen. Im Gegensatz dazu wird der gewöhnliche Tourismus durch extremale Arten ersetzt. Manchmal werden extremale Einwirkungen auf den Organismus mit Verletzungen beendet.

Der Sporttourismus beinhaltet in allen seinen Arten eine Route, die in schwerzugänglichen, neuen, wenig besiedelten und komplizierten Regionen verläuft. Aber es sind keine extremale Bedingungen. Extremale Bedingungen können auch während einer einfachen Wanderung entstehen. Unserer Meinung nach, ist der Begriff "der extremale Tourismus" nicht zulässig, denn er bedeutet, dass die Teilnehmer eine große nicht-touristische Vorbereitung brauchen, was mit dem Wandern wenig zu tun hat. Unter dem Tourismus versteht man eine ungefährliche Routenwanderung, der extremale Tourismus ist das Überleben.

Wir schlagen vor, den Begriff "Tourismus" vom Begriff "Exstremsport" zu unterscheiden. Für touristische Wettbewerbe muss man solche Methodik ausarbeiten, die auch für einfache Leute verständlich ist und sie von der Teilnahme nicht abschreckt.

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William Shakespeare (Уильям Шекспир)

William Shakespeare (1564-1616) was one of the greatest and famous writers in human history. He was born in Stratford-on-Avon, a small town in the middle of England. His father wanted his son to be a well-educated person and William was sent to the local grammar school.

Studying at school the boy actually did not have any free time. But he spent his rare spare hours walking in the forest or watching the river Avon.

Those days there were not a lot of theatres in towns and actors and actresses had to travel moving from one place to another with their shows. Sometimes they visited Stratford-on-Avon. William liked to watch them playing. He got fond of their profession and he decided to become an actor.

He went to London and there he became an actor. At that time he began to write plays too. Shakespeare was at the same time an actor and a playwright. In his works he reflected events of his contemporaries' life. His plays were staged in many theatres, translated into many foreign languages. That made Shakespeare a very popular man.

Most famous of his plays are Othello, King Lear, Hamlet, and Romeo and Juliet. They are still popular and you can watch his .plays in almost any country of the world. He produced thirty seven plays. He had connections with the best English theatres for about 25 years.

William Shakespeare wrote also a lot of poetry including his unbeaten sonnets. There are numerous songs written with his poems. He is still most often published author of the world and well known among people. We do not know much about his life. We can only guess what kind of man he was analyzing the legends and a few documents of the time.

Shakespeare died in 1616, but millions of people today still admire his plays.

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Maori are the indigenous people of New Zealand (Маори – коренные жители Новой Зеландии)

Probably many of us watched the Hollywood film version of J.R.R. Tolkien books about the world of Middle-earth at least once, we all know that the shooting has taken place in New Zealand. But just few people can tell about natives of this country, which ethnic groups, as well as characters of the Oxford University's professor, 'sailed on the seven canoes from another world'. These lines are about 'Maori'.

In traditional Maori language the word 'Māori' is set as 'common' or 'natural'. In epics the word 'Maori' distinguished people from a deity and a spirit. Although, surprisingly, the first people mentioned the term in the 1830s was European colonizers to distinguish between 'common' and 'white people' (Pākehā)². Mayorets call themselves 'iwi' what means 'people'. Ivy is traditionally divided into several hapū (hapū) or clans. ³At the head of the clan was the leader of 'rangatira' and he has played an important role in the development of the art because he has distributed orders to artistic handicrafts. His authority was maintained by 'tohunga' - the cleric whose main task was to perform rituals and customs compliance. In the Maori community artisans were honored by everybody and their skills were passed on from a father to a son⁴.

Maori did not use the written information transfer, an alternative was wood carving. That's why we get more information looking more closely at the design of their life and home decoration.

² К. В. Малаховский. История Новой Зеландии. — «Наука», 1981.

³ С. П. Миронов. Британские колонизаторы и туземцы Новой Зеландии 1769— 1840 гг.: межцивилизационные отношения в контексте колониальной политики. — Саратов, 2005.

⁴ Владимир Кабо. Становление классового общества у народов Океании (Опубликовано в.: Народы Азии и Африки, 1966, № 2. с. 57–68

Maori settled the coast of the North Island, engaged in hunting and fishing. They fearlessly resisted to European colonization but in 1840 46 Maori chiefs signed a treaty which agreed to join British sovereignty. In 1850 even the position Maori King was established. But the real power the king (or queen) has only in the public life of the people, the political one remains 'Terra Inkognito'⁵.

Today in New Zealand live, according to the population census of 2013, 598.6 thousand of Maori what represent 14.9% of the population. Approximately 126 thousand of Maori live in Australia and 8 million - in the UK. Most of the Maori live in cities. Increasingly, they are moving away from the traditional way of life, only 14% of them speak their native language, the majority of the Maori in their daily life prefer English one.

The level of education is on the fairly low level although Maori have equal rights with other nations. It follows the basic problems of the Maori: unemployment and a high crime rate.

I'd like to pay attention to the people who always dance 'hack' on the greetings. I wish to add that no matter how extravagant in every sense were Maori, whatever lifestyle they had, the fact that they were able to save their culture, identity to remain true to their roots through the centuries deserves large praise.

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⁵ С. П. Миронов. Британские колонизаторы и туземцы Новой Зеландии 1769— 1840 гг.: межцивилизационные отношения в контексте колониальной политики. — Саратов, 2005.

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English Traditions (Традиции Англии)

Every country and every nation has its own customs and traditions. You cannot speak about England without speaking about its traditions and customs. Englishmen are proud of their traditions and carefully keep them up.

The English are stay-at-home people. "There is no place like home", they say. When they don't work they like to spend their days off at home with their families.

Englishmen are very fond of their fireplaces, that's why many of them prefer the open fire to central heating.

They like to live in small houses with a small garden. People all over the world know the saying "The Englishman's home is his castle".

British are polite and never get tired to say "Please" and "Thank you". They are disciplined and will not talk loudly in the street. They are not pushed to take a seat on a bus or train, and stand in a queue at the bus stop. The British don't shake hands at a meeting. They try not to show emotion in public, even in tragic circumstances. They do not lose their composure and remain optimistic in difficult situations.

They say that English people keep to their traditions even in meals. Porridge is the dish Englishmen are very fond of. Many of them eat porridge with milk and sugar for breakfast. As for the Scots, for example, they never put sugar in their porridge, they always put salt in it.

The English are tea-drinkers. They have it many times a day. Some Englishmen have tea for breakfast, tea at lunch time, tea after dinner, tea at tea-time and tea with supper. Some English families have "high tea" or big tea and no supper. For high tea they may have cold meat, bread and butter, cakes, and, of course, a lot of tea. The Englishmen always drink tea out of cups, never out of glasses.

On weekends those who live in big cities like to go to the country side. Every Englishman loves to spend time in a country house with garden and rose bushes on the porch - in the open air, away from the bustle, in peace and quiet. Those who remain at home, try to do all the things that do not have time to do this week. Someone on a Saturday morning walk to the shops, someone engaged in farming - washing and cleaning. Someone attends sporting events or playing sports themselves.

Saturday night is a good time for parties, dancing, going to the cinema or theater.

On Sunday, after lunch Englishmen usually work in the garden, walk the dog or visit the pub. On Sundays, they usually invite friends and relatives over for tea.

English Culture is distinctive and rich in traditions, which are passed through the centuries.

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History of Tea in Britain (История чая в Великобритании)

A cup of tea is a vital part of everyday life for the majority of people in Great Britain. In fact, tea is so integral to our routine that it is difficult to imagine life without it! But it was not always so; tea was once a luxury product that only the rich could afford, and at one time there was even a debate about if it might be bad for the health. It was over the course of several hundred years that tea gained its place as our national drink, and only relatively recently that its health-giving properties have been recognized.

The English custom of afternoon tea goes back to the late 18th century, when Ann, wife of the 7th Duke of Bedford, decided that she suffered from a "sinking feeling" around 5 p.m. and needed tea and cakes to bring back her strength. Before long, complaints were heard that «the laborers lose time to come and go to the tea-table and farmers' servants even demand tea for their breakfast». Fashionable Tea Rooms were opened for high society, and. soon tea became the national drink of all classes.

Today the British drink more tea than any other nation: 1650 cups of tea a year. They drink it in bed in the morning, round the fire on

winter afternoons and out in the gardens on sunny summer days. In time of trouble the kettle is quickly put on the tea is made and comforting cups of the warm brown liquid are passed round.

Tea has even played its part in wars. When George III of England tried to make the American colonists pay import duty on tea, a group of Americans disguised as Red Indians dumped 342 chests of tea into the sea in Boston Harbour The Boston Tea Party which led to the War of Independence. In another war the Duke of Wellington had a cup of tea before starting the Battle of Waterloo «to clear my head», as he said. In peace time Gladstone remarked: «If you are cold, tea will warm you, if you are heated it will cool you, if you are depressed it will cheer you, if you are excited it will calm you».

What exactly is tea? Basically it is a drink made from the dried leaves of a plant that only grows in hot countries. The British first heard of tea in 1598 and first tasted in about 1650. All tea was imported from China, then from 1820 from India. Today London's tea markets deal in tea from India, Ceylon and Africa, more than from China.

There are four different types of tea: white tea, green tea, oolong tea and black tea. The type of tea depends on the type of tea processing it undergoes. Tea as we know it in the UK is more often sold as teabags. Most popular brands of teabags are usually made by blending a variety of different teas together. Tea is renowned for containing numerous antioxidants and less caffeine. There are also certain teas used in diets and tea for weight loss.

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Environmental protection in Great Britain (Защита окружающей среды в Великобритании)

Mankind for a long time believed that whatever we did, the Earth would remain much the same. Now we know that it is untrue. Nature is in danger. One country's pollution can be every country's problem. Such vital sources as air, water, minerals are being destroyed. We all need to work together to save our environment.

The protection of environment has become of international importance. This problem is very urgent today. Great Britain also stresses the need for improvement of environmental protection. The control for emissions of harmful substances restricts air, land and water from the most harmful processes. Responsibility for control rests with local and central government. Great Britain has adopted a programme of reductions in sulphur dioxide emissions from many plants. Most petrol stations in Britain are gated. Strict controls have reduced hydrocarbon and nitrogen oxide emissions.

The British government worked out the rules for the use of the Earth's atmosphere. Total emissions of smoke and sulphur dioxide in the atmosphere have fallen by over 85 per cent since 1970. The government is committed to the elimination of chlorofluorocarbons which damage the ozone layer. It is also contribute to the green-house effect, which leads to global warming and a rise in sea levels.

The Government attaches great importance to the protection of national parks; they cover 9 percents of the total land area of England and Wales.

The government is supporting international efforts for a protection rare species of plant and animal life. It is also supporting projects to conserve endangered species of wild life.

The territorial waters of most zones are already being spoiled, but the National Rivers Authority of Great Britain protects waters in England and Wales. In Scotland the river purification authorities are responsible for water pollution control.

Britain attaches particular importance to the environmental policy of the European Community. Much has already been achieved: since Britain joined, the Community has adopted 280 environmental measures, including far-reaching legislation to combat acid rain, to reduce pollution from cars and industry, to conserve wildlife and to ensure public access to information about the environment.

Our moral obligation is to take great care of our planet and pass it to the future generations in good order.

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The advantages of PR and advertising in the Internet (Преимущества PR и рекламы в Интернете)

In the modern world, advertising and PR in the Internet settled on a par with traditional media platforms. Via computers and gadgets people can not only communicate in social networks and look through information on Web sites, but also can watch TV programs, listen to the radio, read newspapers, and, of course, receive advertising messages.

This area is very effective and perspective. The Internet hasn't taken the top position among the public yet, but it has a number of advantages.

The first advantage is unobtrusiveness. Advertising messages in social networks are mostly constructed such way that the user can't immediately understand that it is an advertising message, and rarely shuts his ears to it. Advertising messages in the social networks are mostly infotainment, so user may want to tell about this interesting advertising message to their friends via "Share" or "Repost" (publication of link to a message on user's personal page).

The second advantage is that advertising is "The-Word-Of-Mouth". "Sharing" the advertising message has two beneficial features: 1) it gives the opportunity to cover more audience, because user's friends who "shared" the message will see it too, and 2) it increases the credibility to the product: the user's friends think that if their friend recommends that product it means that he has already tried it himself and he has been satisfied with its quality, and therefore, most likely they will be satisfied with it too.

The third advantage is mobility. We can't always have an access to newspapers, radio and television in the conventional form, but we can always read/listen/view some of them through the gadgets. Moreover, advertising message in social media allows to reach the recipient regardless of its location.

One more advantage of advertising or PR companies in the social media is interactivity. Traditional information sharing platforms don't

provide adequate feedback: their message reaches the consumer, but it's often impossible to give any response on it. In the Internet users have an opportunity to express their opinion, to complain about something, suggest some changes and ask some questions. In this case users who get an answers to their questions or get some other response will be more loyal to the company, because users will understand what customers really matter to a company and any problem will be solved very quickly.

Most large and medium-sized companies have own Web pages so they increase the number of loyal users by loading some interesting information about the brand and its products or interesting facts about the company's business or some kinds of comic materials about the product. But still the main way to increase the amount of users is, of course, by means of response to user's feedback.

Facing the advantages described in this article we can say that social media marketing is really effective and perspective method of promotion.

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Inside Yellowstone (Обратная сторона Йеллоустона)

Yellowstone National Park covers 3,472 square miles. Even though the official address is the state of Wyoming, Yellowstone is actually in three states. The majority of the Park (96%) is in Wyoming. A small section of the Park (3%) to the north and northwest is in Montana. And a small section of the Park (1%) to the west is in Idaho.

So you've heard about Yellowstone volcano. But where is it? Most people look for a cone-shaped mountain when you say volcano. Yellowstone has several of those. The whole area is a massive high plain domed upward due to the pressure of magma below. That accounts for the park's high elevation which averages 8000 feet above sea level. The Yellowstone volcano has erupted many times over millions of years but the last three eruptions left calderas or craters in the park. The last eruption over 640000 years ago left a crater 30 by 45 miles wide. Lava continued to seep out of the volcano after the last eruption and some of those lava flows filled in portions of the caldera so it's not as deep as it once was. Much of the park is actually in the crater and the large size makes it difficult to tell you are in the crater of a big volcano.

There are a few places in the park where you can see the caldera; Gibbon Falls, Washburn Hot, Spring Overlook, from the top of Mount Washburn. It is probably best seen from outer space. From the vantage point, you would actually see that the Yellowstone volcano or hotspot is responsible for a series of calderas that stretch from the park, south and west to Nevada. The hotspot or magma chamber below ground has erupted periodically over last 16 million years as the continental plate has slowly drifted over the top of it, creating a string of volcanic eruptions and calderas.

Yellowstone sits atop the magma chamber today and though it may be difficult to perceive the volcano, the plethora of hot springs and geysers are a good reminder that it is there, just under our feet.

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Wie feriert man Weihnachten in Deutshland (Как празднуют Рождество в Германии)

Weihnachten ist eine besondere Zeit in Deutschland. Es ist ein hohes religioses Fest, der Tag der Geburt Christi.

Weihnachten beginnt in Deutschland schon sehr früh - 4 Wochen vor dem 24. Dezember. So hat man Zeit, sich darauf zu freuen und sich vorzubereiten .Die Zeit vor Weihnachten heiBt Adventszeit.

Die vier Sonntage vor Weihnachten sind die vier Adventsfeiertage. Der vierte Sonntag vor Weihnachten ist der 1. Advent. An diesem Tag werden alle Gegenstände aus dem Schrank geholt, die etwas mit Weihnachten zu tun haben: der Adventskranz, die Pyramide, der Rauchermann, die Krippe... und im Wohnzimmer aufgebaut. Am Adventskranz wird die erste Kerze angezündet. Zum nächsten Advent zündet man zwei Kerzen an und so jeden Sonntag, bis am Sonntag vor Weihnachten vier Kerzen brennen.

Zur Weihnachtszeit wird in den Familien gesungen, gemeinsam werden Plaetzchen gebacken, die Kinder schreiben oder malen ihre Wünsche auf einen Zettel und geben ihn den Eltern.

Jedes Kind hat einen Adventskalender. Das ist ein buntes Bild, auf dem kleine Türchen versteckt sind. Man sucht die Zahl des heutigen Datums. Jeden Tag öffnet das Kind ein Türchen, am 1.Dezember das Türchen mit der Zahl 1.

Insgesamt sind es 24 Tuerchen. Das letzte und groeßte wird am 24. Dezember geöffnet, denn nun ist Weihnachten.

Weihnachtssymbole sind:

1) Der Tannenbaum

Unter historischer Sicht ist er wohl noch nicht allzu lange als typisches Weihnachtssymbol bekannt. Er wird (aus vorchristlicher Zeit) mit Wachstum und Fruchtbarkeit in Verbindung gebracht.Die zeitlichen Angaben, wann er erstmals genannt wird, schwanken:

- 1509 auf einem Kupferstich Cranachs des Alteren

- 1539 für Straßburg (ElsaB) und den Schwarzwald

- durch Martin Luther und die Reformatoren zum Weihnachtssymbol der Protestanten ernannt

- 1816 erstmals in Österreich aufgestellt (von einer gebürtigen deutschen Prinzessin)

- 1945 in Italien eingeführt (durch US-Soldaten)

2) Der Weihnachtsmann

Er soll erst im 19. Jahrhundert in «Mode» gekommen sein. Sicher ist das in Verbindung zu sehen mit Santa Claus, der 1812 in einem amerikanischen Kinderbuch auftauchte.

Im Süden Deutschlands ist bis dahin der Nikolaus am 24.12 zum zweiten Mal (zuerst am 6.12.) erschienen.

Der heutige Weihnachtsmann ist im allgemeinen ein freundlicher alter Mann.

3) Das Christkind

Im 14. Jahrhundert sollen Bewohnerinnen von Frauenklöstern zur Weihnachtszeit Visionen vom Christkind gehabt haben. So wurde das

Christkind besonders eng mit Handlungen zu Weihnachten in Verbindung gebracht.

Heute bringt vor allem in katholischen Gebieten das Christkind die Geschenke zum Christfest.

Man feiert Weihnachten zwei Tage, am 25. und 26. Dezember. Die Weihnachtszeit endet mit dem 6. Januar, dem Dreikönigstag.

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Innopolis - the city of the future (Иннополис – город будущего)

One of the most ambitious projects, which is able to give an impetus to Russia's economic development, has successfully been started. Innopolis is a new city in Russia, which is located in the Republic of Tatarstan, was opened in June, 2015. There is no doubt that this modern city will be the center of attraction for world-class scientists and ITspecialists.

The University of Innopolis is its brain center. This university trains young specialists in the field of modern IT-technologies. The University of Innopolis provides trainings in such specialties as Human-Robot Interaction, Haptic, Field Robotics, Robotic Vision, Machine Learning and etc, which are not so popular in Russia and are unique for the university. The teaching stuff consists of the best Russians and foreign IT- specialists.

The University of Innopolis was first opened in 2013 and temporarily located in Kazan in Profsouznaya Street. There are two groups of students who started to study at this university this year.

There are laboratories and libraries besides lecture rooms in the university. Students live in the dormitories nearby. Also, for the convenience of students, there is a sports complex, a medical center, dining rooms, lounges, a football field, outdoor tennis courts and parkings. The Innopolis University and Carnegie Mellon University, which is the global leader of the IT-education, developed STEM course (Science, Technology, Engineering, Mathematics) for students of middle and high school. This course has five fields: mathematics, programming, physic, robotics, English and its aim is for students to enjoy their mathematics and physics lessons. Less boring theory - more practical work!

The guide of the university is sure that the modern world-class programs will help to engage all the students in research work. Cooperation with the local industry and research laboratories will make it possible to train students for real projects. An integrated approach in training, which cover all areas of professional activity, allows graduates of the university to become not only highly qualified engineers but also teach them to manage high-tech companies properly. The guide of the university thinks that the active development of university research program will not only attract students and make them more creative, but will also create a place for new investments.

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Britain's Agriculture (Сельское хозяйство Великобритании)

The physical environment and natural resources of England are more favourable to agricultural development than those of other parts of the United Kingdom. A greater proportion of the land consists of lowlands with good soils where the climate is conducive to crop growing. The majority of English farms are small, most holdings being less than 250 acres (100 hectares); nonetheless, they are highly mechanised.

Wheat, the chief grain crop, is grown in the drier, sunnier counties of eastern and southern England, where new, stronger varieties have become increasingly widespread and average yields have risen significantly. Barley is grown mainly for livestock feed. The acreage under oats is gradually declining. Corn (maize) and rye are also grown. Principal potato-growing areas are the fenlands of Norfolk, Cambridgeshire, and Lincolnshire; the clay soils of Humberside; and the peats of North Yorkshire.

Sugar-beet production depends heavily on government subsidy because of competition from imported cane sugar. In recent years, acreage and yield for rape have increased. Grass and its variants are grown for feeding livestock.

The growing of vegetables, fruit, and flowers, known in England as market gardening, is often done in greenhouses and is found within easy trucking distance of large towns, the proximity of a market being of more consequence than climatic considerations.

The fertile (clay and limestone) soil of Kent has always been conducive to fruit growing. Cultivation was first established there on a commercial scale in the 16th century. The county of Kent is a major supplier of fruits and vegetables (apples, pears, black currants, cauliflowers, and cabbages).

Hereford and Worcester is noted for its plums, while Somerset and Devon specialise in cider apples.

The agriculture of England is primarily concerned with livestock husbandry and, in particular, with milk production.

Dairying is important in every county, though the main concentrations are in western England. The quality of dairy cattle was improved considerably after World War II. The higher-yielding dairy breeds, including the Frisian and Ayrshire, have become more numerous than the once-dominant Shorthorn.

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Sakura – the symbol of Japan (Сакура-символ Японии)

In Japanese, the cherry is called "Sakura", which is generally believed to be a corruption of the word "Sakuya" (blooming) from the name of Princess Kono-Hana-Sakuya-Hime. This long name means "tree-flowers-blooming princess". The princess was named so because, it is said, she fell from heaven upon a cherry tree.

The cherry blossom symbolizes the national character of the Japanese people. The Japanese are very proud of their Sakura. They love to see not only the single petal cherry blossoms in their prime and freshness, they also relish the beauty of falling snowy petals in the spring breeze. Of all flowers, the cherry blossoms appeal most to the aesthetic taste of the Japanese people. The Japanese people are never so jubilant as they are at the time of "Sakura" blossom.

Since very early days, the people have expressed their love and admiration of the flower in various ways; poets and artists have always been eager to depict the loveliness of the blossom in words and colors. Japanese people constantly use "Sakura" as a motif on kimonos, pottery and other decorative items.

The Japanese cherry tree does not yield fruit like other cherry trees. A critic once remarked that it is born aristocrat and its single mission is to be beautiful. But it renders a very useful service to the Japanese people. The wood of the cherry tree is very valuable. It is used for producing color prints, furniture, trays, and ornamental columns for alcoves and so on. In old days Sakura wood was used for making printing blocks for books and pictures.

The blooming period of Sakura is very short, only a few days. So, people usually stop their daily work or close up their shops to have Sakura viewing picnics at the best and most convenient places. It is the merriest occasion of the year, with drinks, music and songs. Many people wear ridiculous masks and fantastic costumes. Those who wish to enjoy flower viewing in a quiet atmosphere make visits as early as 8 or 9 A.M. They may also choose a remote mountain or sea shore regions which are not visited by very many people.

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The new creative source of knowledges TED.com

TED (Technology, Entertainment, Design) is a global set of conferences owned by the private non-profit Sapling Foundation, under the slogan "ideas worth spreading".

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Oscar - the main US Movie Award (Оскар – главная кинопремия США)

«Winning the Oscar Award is considered to be the ultimate achievement in the film world, the epitome of professional success» Emanuel Levy, American film critic An important part of American culture is the cinematography. It's a well known fact that American cinema is one of the most popular and profitable in the world.

In 1929 there was created a ceremony of awarding the Prize of the Academy Awards better known as Oscar. Promotion and motivation of those who are involved in creating a movie was the main purpose of such kind of ceremony.

The American Film Academy consists of more than 5,000 voting members, each one of them belongs to one of the 16 different industries. The largest of these industries is the acting one. Every industry votes on its category. The only decision that they make together is choosing «Best Film» of the year.

The official awards ceremony is broadcast in dozens of countries live.

Millions of people around the world are watching and waiting for the prize. It is because this is not just an award ceremony - this is the amazing show with a witty presenter and the most well-known members of the film industry (producers, directors, writers, composers, actors, etc.).

The black American actor and comedian – Chris Rock was the presenter this year. He turned into a joke the sensational scandal of the year about the lack of black nominees for this award.

When the stars come out to announce the winners, they joke and have fun on the stage.

The red carpet is also very important part of the ceremony. Every year fashion critics choose the most gorgeous star's outfit, and the most bizarre and unusual one.

Thus, the Academy Awards is the most prestigious one. All of the films which are nominated are really worth watching. And all of the winners did a great job to get this award. That's why when Leonardo DiCaprio finally received Oscar in «Best Actor»nomination of this year, the whole audience gave him a generous ovation. They knew that he's been waiting for this day for so long, and he's been working very hard for many years.

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British title (Британский титул)

The British title and its order of precedence is the most baffling, yet simple concept on the planet. Children of nobility and those who wished to become a part of it had the following concepts drilled into their heads from birth. Since neither of us are lords or ladies, we generally have to muddle along in hope of getting it right. Below you'll find the order of precedence directly from a book of heraldry published in 1910. Things have obviously changed since then, but this was the rule of thumb for harried hostesses throughout the 19th century.

By marriage, women share the dignities and precedence of their husbands, but the strictly official dignity of a husband is not imparted to a wife (except in India) in the case of the Archbishops and Bishops or holders of other offices. The dignities which ladies have by birth or by right of inheritance, are not imparted by marriage to their husbands, nor does marriage with an inferior in dignity in any way affect the precedence that a lady may enjoy by birth, inheritance or creation—both her own precedence and that of her husband may remain as before their marriage, unless the husband be a peer.

To whatever precedence she may be entitled by birth, the wife of a peer always takes her rank, and therefore takes her actual precedence from her husband. The widow of a peer, so long as she remains a widow, retains the rank she enjoyed whilst married, but should she contract a second marriage, her precedence then is determined either by the rank of her second husband, or by the rank that was her own by birth and which she enjoyed before her first marriage. The wife of the eldest son of any degree precedes all her husband's sisters and also all other ladies having the same degree of rank with them.

A peeress by marriage who is also a peerage in her own right signs first her husband's title, adding her own afterwards: The Countess of Yarborough is Marcia Yarborough, Cauconberg and Conyers. The daughter of a peer if married to another peer takes the precedence of her husband and relinquishes her own, but she retains it if she marries a commoner, and one of the anomalies of the English scale of precedence is to be found in the following circumstances: if the two elder daughters of a duke were to marry an Earl and a Baron respectively, whilst the youngest daughter were to run away with the footman, she would, nevertheless, rank as the daughter of a Duke above her sisters ranking as wives of an Earl and a Baron.

The precedence of WOMEN is determined, before marriage, by the Rank and Dignity, but not by the Office, of their father. All the unmarried sisters in any family have the same degree, which is the degree that their eldest Brother holds (or would hold) amongst men. Thus: Of the sons of an earl, the eldest alone has an honorary title of nobility and is styled "My Lord," while all the Daughters of an Earl have a similar honorary Title and are styled "My Lady."

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Features of education in the USA (Особенности образования в США)

Today the American education system is considered to be one of the best in the world. The USA is world leaders in scientific discoveries and technological innovations and the American universities are in the first places of ratings. What are the features of the American education system?

The first thing that should be noted is that the system of school education in America is similar to the Russian. It consists of 3 levels: elementary schools, middle schools, high school. The main difference is the 12 class and that high school students can choose subjects.

The situation is quite different with higher education in the United States.

Firstly, in the USA College has the same meaning as the University. The difference is that the college is focused on study and the university is focused on scientific activity. Also in the USA unlike Russia there is no big difference between the state and private universities.

Secondly, in the US, there is no unified Ministry of Education. Each state has its own Department of Education, but their powers apply only to primary and secondary education. So, universities are completely independent. Students are also independent - they choose for themselves academic subjects and decide how and what to learn. So there is no concept of academic group and every lesson student spends with different people.

Thirdly, since universities are independent, each university can organize its own learning process and in every university students can learn unique subjects. The feature common in many US universities is structure of distribution of courses. It is divided into 4 parts:

1. core courses - the first 2 years of study, basic higher education;

2. a major - main subject, basis of future specialty;

3. a minor - second most important subject;

4. electives - additional courses.

In conclusion, it would seem that in the United States applicant enters the university as a whole, not to any particular faculty or specialty. Also in each university the staff of advisers is ready to help with the schedule and subjects. This greatly simplifies the problem of choosing a future profession, which is so good for many applicants.

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Linkin Park (Группа Линкин Парк)

Linkin Park — an American alternative rock band formed in Agoura Hills California. Having been around since 2000 under the name Linkin Park, a group twice been awarded the "Grammy".

The group was founded in 1996 by two classmates Mike Shinodas and Brad Deltona (which are now in the group). The band's members were Mike, Brad, Joe, Dave, Rob and Mark. Originally it was called Xero. After Chester joined the band, it was called Hybrid Theory. The guys had some problems with the British electronic group, which had the name Hybrid. So they came up with a new name — Lincoln Park. But the domain lincolnpark.com was busy, and the band took the name Linkin Park.

The group found success with their debut album in 2000 called Hybrid Theory, sold over 30 million copies (in 2010 he found "diamond" status, awarded RIAA), and for the song "Crawling" the group received a "Grammy" in the nomination "the Best performance in the style of hard rock"

In 2003 they released their second album titled Meteora, who headed the Billboard 200.

The next studio album "Numb/Encore" (JAY-Z& Linkin Park) released in 2006 brought them their second "Grammy" award.

15 May 2007 they released the album "Minutes to Midnight", in which the group moved away from the previous style.

The album" Living Things" was sold out in almost 3 million copies.

The name of the fourth album "A Thousand Suns" is due to the atomic bomb and the end of the world.

In total, the album was sold in approximately 73 million copies.

In 2005, the group has established a charitable Foundation "Music for Relief", helping victims of natural disasters.

In 2011 the group was awarded the Global Leadership Awards for their cooperation with the UN.

This group is not afraid to take risks, which is why they remain popular 20 years later.

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British band «Placebo» (Британская группа «Placebo»)

Placebo is an English alternative rock band, founded in London in 1994 by the singer-guitarist Brian Molko and guitarist-bassist Stefan Olsdal. The band was soon joined by the drummer Robert Schultzberg,
who was replaced in 1996 by Steve Hewitt. Hewitt parted ways with the band in 2007 due to different personal and musical differences and was replaced the following year by Steve Forrest, who left the band in 2015 to pursue his own musical career. Not long after the departure, Matt Lunn joined as the band's current drummer.

At the moment, the band has released seven studio albums. **1. Placebo (1996).** Placebo's self-titled debut album was released on 17 June 1996. This album was written under the influence of another well-known alternative band Sonic Youth. The band also claims it was influenced by PJ Harvey, Pixies, David Bowie and Depeche Mode.

2. Without you I'm nothing (1998). In 1998 Placebo issued their follow-up album. This album is different, full of melancholy and depression. «It is more melancholic, definitely more adult; our music has matured nicely».

3. Black market music (2000). «This album is cold, angry and political. We want to create kind of a puzzle, as if it were music, which would be forbidden. Something like that you would have to buy under the counter. We knew that even before the official release the album would appear on the black market.

4. Sleeping with ghosts (2003). "Sleeping With Ghosts" is a warmer and livelier album. It's about memories, about how you find or do not find a way to your memories.

5. Meds (2006). This album is a favorite one for many fans. «Meds» is different because of its bright and rich sound, and at the same time it is very dark. This has become a critical moment for the band: on 1 October 2007 it was announced that Steve Hewitt was no longer in Placebo.

6. Battle for the sun (2009). In August 2008, the band announced their new drummer, Steve Forrest from the band Evaline. «When we met to discuss and plan the recording of this album, we all looked into the future with optimism, after the dark period that we call a divorce. We had a depressing period after which we began to feel more optimistic».

7. Loud like love (2013). On 21 May 2013 Placebo announced their seventh studio album, «Loud Like Love». This album is very mature; it sums up all of the recorded material. «Loud like love» is very difficult to comprehend the first time you hear it.

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Disney, the Magician (Волшебник Дисней)

The Walt Disney Company is one of the most famous corporations worldwide. However, despite this recognition, the history of Disney is still vague. Here are some little-known but interesting facts about the Disney world and its creator.

Genius without talent and ideas: Walt Disney, no doubt, was not only a talented cartoonist but also an experienced businessman. He founded a great empire, and could radically change the approach to the creation of cartoons and children's entertainment. The most surprising fact is that he was fired from a small newspaper, where the young genius worked at the dawn of his career, because of lack of talent and ideas.

The best-seller: The first feature-length animated film in history was presented by Walt Disney. It was the cartoon "Snow White and the Seven Dwarfs". It was being made for three years and more than 570 animators were creating it each year making millions of hand-drawn frames. The film collected over \$ 100 million dollars and got an Oscar.

Orange Grove and amusement park: The idea of Disneyland was born when more and more people began to express a desire to visit the Walt Disney studio to see with their own eyes how its wonderful characters were created. So in 1954 Disney bought 65 acres of orange groves in New Orleans where he began the construction of a theme park.

Prototypes of cartoon characters: Walt Disney and his animators drew ideas from real people. The prototypes of Gavs mother and brothers - the bandits from the animated series "Duck Tales" - were members an actual 30s gang. Aladdin was copied from Tom Cruise, Gene - from Robin Williams, and Ariel - from Alyssa Milano.

Scandalous Lion King: The first, the scientists disagreed how hyenas were pictured. Researchers said that the negative image of these animals could result in harm to their populations. Then the accusation of plagiarism appeared. As it turned out, the story resembled the Japanese show "Kimba - the White Lion". However, the claim of the Japanese was turned down with the help of the experienced lawyers of the company.

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The University of London (Лондонский Университет)

In the early nineteenth century Oxford and Cambridge were the only two universities in England. The cost of education at these universities was so high that only the sons of the wealthier classes could afford to attend. But more restrictive still were the religious tests. It was to overcome these limitations that in 1827, in Gower Street, London, a nondenominational college, "University College" was founded. Its first years were years of strug-gle for survival against hostile forces of Church and State.

In 1836 these two institutions, University College and King's through a typically English compromise joined forces. Each retained the control of its own internal organisation, faculty, and teaching; a separate body, the University of London, was created to "conduct the examination of, and to confer degrees upon, their students".

In the early years a candidate for a University of London degree was forced to attend either University College or King's, but in 1849 it became possible for an institution situated "anywhere in the British Empire (and recognized by the U. of L.) to present students for degrees" — a unique provision.

Up until 1900 the University was only an examining body but in that year an Act of Parliament permitted that "The Senate... may provide lecture rooms, museums, laboratories, workshops, and other facilities for the purpose both of teaching and research." This allowed the first actual teaching on any level; however the Senate has never invaded the undergraduate field, except specialized subjects.

Today the University has much the same form of organization adapted to accommodate its increased size and complexity. It is governed by a Vice-Chancellor, a Court, and a Senate. The Senate composed of representatives of the constituent colleges and schools, nominees of the crown, the London County Council, certain pro-fessional bodies and graduates, is the supreme academic authority. The University of London is a federation of colleges, each largely independent, and the whole inde-pendent, of the British Parliament in academic matters.

The "Department of Extra-Mural Studies" enrolls nearly 12,000 persons. There are in London four faculties of Theology, thirteen of Arts, thirty-one of Medicine, ten of Science, etc., etc. At present there are ten "Institutes" of which the Institute of Education is one. Total London enrolments in 1954—55 were 18,201 full-time students, 5,315 part-time. About one-fifth of the university stu-dents in the United Kingdom are at the U. of L.

In many ways the University has departed from the traditions of Oxford and Cambridge. London was the first to abolish religious tests, to admit women in England for degrees, to grant degrees without residence. Recently the Senate abolished — not without a stir — the requirement of English for entrance. The cap and gown are missing in classes here but the tradition of scholarship is strong.

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Муллагильдина Карина

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Foodsharing

Now, foodsharing is actively developing in many countries. This project helps to contest with overconsumption and enables people in need to have affordable food.

Foodsharing movement was created in Berlin. In modern society, there is a problem: a huge amount of fresh food is just thrown out unclaimed daily. At the same time, people in many countries feel hunger and acute shortage of products right now. Therefore, foodsharing addicts decided that people can share food with people who really need food.

Every day in cafes, restaurants and grocery stores still edible products are thrown out. For example, in hotels after each breakfast, lunch or dinner food which is not eaten by visitors or hasn't been taken by employees is just thrown in the trash. The same thing happens at the restaurants that have showcases: at the end of the day all the dishes will go in the trash, because the next day they will not be marketable. According to estimates of the European Commission, about 40% of food is lost after harvest during processing and consumption. Speaking of other products 40% of food is lost by consumers after purchase.

In every country where foodsharing develops, people are struggling with overconsumption in different ways: for example, in Georgia "social fridge" was set, where anyone can leave the products that are not necessary. In Germany, foodsharing members cooperating with restaurants and cafes at the end of the day receive a free meal, which is completely edible. But due to the fact that it lay all day in the showcase it just could be discarded. In many countries, people share products via social networks.

Some people think that foodsharing is when people give away overdue products or food of poor quality. It's not like that at all. Everyone has their own reasons to share food: some people really want to help those in need and buy products especially to feed someone. Some people just do not have time to eat what they bought.

Foodsharing is urging not to throw away food that you do not need, but which is still edible. This food should be given to those people who need it.

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Natural wonders of GB and the USA (Природные достопримечательности Великобритании и США)

Nothing is so amazing and so mysterious as the wonders that are created by nature.

There are hundreds of natural wonders around the world that would take a lifetime to see. The United States of America has some of the most beautiful natural wonders of the world. There are waterfalls and rainforests, reefs and erupting volcanoes, deserts and giant redwood trees.

Death Valley (Долина смерти)

Death Valley is a 250 km valley between two Californian mountain ranges. It is the hottest and the lowest place in the USA, and at one famous point – Badwater Basin – you arrive at the lowest place in the western hemisphere (86 metres below sea level). Summer temperatures in Death Valley can reach 54° C.

Giant Redwood and Bristlecone PineTrees (Редвуд)

General Sherman, a giant redwood tree of 84 metres high, is the largest plant in the world. It is also 3,000 years old, but it isn't the oldest tree in the world! That's also in California. The bristlecone pine grows in the White Mountains, and it is the oldest living thing on earth. The most famous, named Methuselah, is over 4,000 years old.

Niagara Falls (Ниагарский водопад)

The Niagara Falls is formed where the Niagara River flows between Lake Erie and Lake Ontario. There are two main waterfalls: the Horseshoe Falls in Canada and American Falls in the USA. The falls are 55 metres high and 160000 cubik metres of water flow over them every minute.

Giant's Causeway («Дорога великанов»)

The **Giant's Causeway** is an area of about 40,000 basalt columns, the result of an ancient volcanic eruption. It is located on the northeast coast of Northern Ireland. It was declared a World Heritage Site by UNESCO in 1986. Most of the columns are hexagonal (six sides), although there are also some with four, five, seven and eight sides. The tallest are about 12 metres high and 28 metres thick in places.

Scottish Highlands (Шотландская возвышенность)

The **Scottish Highlands** include the mountainous regions of Scotland north and west of the Highland Boundary Fault. The area is generally sparsely populated, with many mountain ranges dominating the region, and includes the highest mountain in the British Isles, Ben Nevis. Before the 19th century however the Highlands was home to a much larger population. The average population density in the Highlands and Islands is lower than that of Sweden or Norway.

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What prevents learning? (Что мешает учиться?)

The "Enemies" of study take all our free time and do not allow us to reach our potential. It's time to discover these "murderers of study" and begin to resist their influence. Since I am a student, this topic is very important for me. I found the list of main factors which prevent our learning in this or that way.

The first in the list is laziness. Ask students about what prevents them from learning, and in 90 % of cases they say that it is laziness. But this does not mean that we are not able to fight it. Very often we are looking for excuses like: "I won't need it in my life", which means you can miss this subject. But then we realize that we shouldn't have missed math and other subjects. My advice is to find the reasons why you want to go to all lecture, not looking for those "which are necessary".

The second enemy is sleep. Once you miss a class, not finding the strength to rise from the bed, but it repeats every week. You have to be able to make plans for the day, then no problems will arise in the morning.

The main "killers" of today are games and Internet. How many evenings and nights do you spent gaming? Not few, I guess. And in various chat rooms, social networks, etc. by gambling away the time needed for healthy sleep and reading books. Games and Internet are real time eaters, they do not leave free time to get ready for studies. But you can learn to divide time for sleep, studies and games. We should do it without fanaticism in network games which modern students suffer from.

The fourth on the list is work. Only few of us can to combine successfully work and study. Work takes time and effort, the student has to choose between study and earning money. In most cases, the choice is to go to work, which in turn horribly affects the studies. If you can, try to combine work with study without consequences for the latter, but otherwise it is better to concentrate all your efforts on learning. Of course, this list doesn't stop here, because everyone has several of his own "murderers of study" and should fight for a successful future.

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Welcher Weg passt zu mir? (Какой путь мне подходит?)

Der Schulabschluss stellt so viele Fragen: Was ist der Unterschied zwischen Uni und FH? Ist ein duales Studium dasselbe wie eine duale Ausbildung?

Wer studieren möchte, hat zwei Möglichkeiten: das Studium an einer Universität oder an einer Fachhochschule. Ein erster Unterschied findet sich bereits in den Zugangsvoraussetzungen: während an einer Fachhochschule das Fachabitur die erforderliche Zugangshürde markiert, benötigt man für den Gang an eine Universität die allgemeine Hochschulreife – meistens der Bachelor. Die Fachhochschulabsolventen können einen Master an der Universität absolvieren. Egal ob man einen Master-Studiengang an einer FH oder Universität studiert, der Master-Abschluss berechtigt grundsätzlich zur Promotion. Während bei der universitären Lehre Wissenschaft und Forschung im Vordergrund stehen, geht es an Fachhochschulen praxisorientierter zu. Somit bereiten Fachhochschulen konkreter auf ein bestimmtes berufliches Ziel vor, während Universitätsstudiengänge eher grob in eine bestimmte berufliche Richtung führen. Einen weiteren Unterschied kann man im Fächerangebot erkennen. Dieses fällt an Fachhochschulen oft deutlich geringer aus und beschränkt sich häufig auf Fächer aus dem Sozialwesen, der Wirtschaft oder der Technik. Für Fächer wie Jura. Medizin oder Germanistik kann man sich dagegen nur an einer Universität einschreiben.

Wer die Theorie eines Studiums konkret mit beruflicher Praxis verbinden will, für den kommt ein duales Studium infrage. Dabei studiert man an einer Hochschule und hat gleichzeitig einen hohen Praxisbezug direkt in einem Unternehmen. Duale Studiengänge können ausbildungsintegrierend sein, sodass der duale Student neben dem Studium eine anerkannte Berufsausbildung absolviert und somit gleich zwei Abschlüsse anstrebt. Eine andere Form des dualen Studiums ist das praxisintegrierende Studium, das sich zwar durch längere Praxisphasen in einem Unternehmen auszeichnet, jedoch am Ende "nur" den Hochschulabschluss verleiht. Auch für das Absolvieren der Theorie- und Praxisphasen gibt es verschiedene Modelle. Während duale Studenten im Blockmodell jeweils mehrere Monate am Stück im Unternehmen oder an der Hochschule verbringen, wechseln sich diese Phasen im Wochenmodell im Wochenverlauf ab.

Auch die Bezeichnung "duale Ausbildung" verweist auf ein Zusammenspiel von Theorie und Praxis. Unter einer dualen oder betrieblichen Ausbildung versteht man nämlich eine Kombination aus einer schulischen Bildung an einer Berufsschule und einer praktischen Ausbildung in einem Betrieb. Hier schließt man einen Ausbildungsvertrag mit einem Unternehmen ab und besucht an ein bis zwei Tagen in der Woche oder in einem mehrwöchigen Blockmodell eine Berufsschule. Eine duale Ausbildung stellt den "klassischen" Ausbildungsweg dar, der in vielen Branchen und Berufen Anwendung findet, etwa im Handwerk, der Industrie oder im Handel.

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The document of the future (Документ будущего)

Many diagnostic centers in Russia currently widely use molecular methods for the diagnosis of genetic diseases and detection of heterozygous carriage of pathological mutations in families at high risk, for the preliminary diagnosis of diseases with a late manifestation and for personal identification (genomic fingerprinting). Gradually, genetic testing for predictive medicine is gaining in strength. Thus, individual and family DNA databases are being created. Such an individual DNA database is a "genetic passport." In other words, a genetic passport is a document reflecting the unique genetic characteristics of an individual, his or her predisposition to some hereditary, multifactorial and other diseases.

The genetic passport can be done in a laboratory where there is an opportunity to perform DNA analysis. To do this, it is necessary to use your blood from a vein or your saliva. Usually, the research is conducted within seven days. The document can be stored in paper or electronic form.

One of the first variants of a genetic passport was proposed by Vladislav Sergeevich Baranov and his colleagues in 1997.

There are several types of genetic passport, such as a genetic identification passport, a genetic map of health and a genetic map of the athlete.

The genetic identification passport is used to identify the individual. It usually does not contain information about human's health. This kind of the genetic passport is required for people who are exposed to extreme work conditions, for example, for rescuers, soldiers, miners, sailors, pilots, etc.

The genetic map of health provides information about the features of the structure of DNA, the predisposition to a number of human hereditary diseases. On the basis of these data, the doctor can choose an individual treatment program for you. The genetic map of health also contains recommendations for the prevention of diseases with increased risk.

The genetic map of reproductive health is one of the varieties of this map. It is recommended for use in family planning centers. It helps to know about a carriage of mutations of severe hereditary diseases for spouses who are planning to have a child.

The genetic map of the athlete includes the results of testing of certain genes that determine human physical characteristics. On the basis of this document the doctor gives some recommendations for a safe and efficient mode of trainings and receiving the necessary nutritional supplements.

In my opinion, every citizen should have a genetic passport. Such a medical document can be of substantial assistance during the examination of the health status of an individual, as well as in assessing the potential risk of developing a particular disease by members of a family at high risk of developing a multifactorial disease.

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US State Nicknames

The United States of America consists of 50 states that are equal subjects of the federation. Each state has its own constitution, legislative, executive and judicial power. Most state nicknames came from the names of Indian tribes and the name of the kings of England and France. State nicknames, approved by the Legislature of the state, usually have advertising character. The tradition of assigning nicknames dates back to the formation of the first states. For example, the nickname of **New York** - "**Empire State**" - is associated with the statement of George Washington: "The State of New York will be the base of our empire."

Delaware is known as the "**First State**", since December 7, 1787 when the first of the 13 colonies ratified the US Constitution. As well Delaware is known as the "New Sweden". In 1638 the Swedes founded a colony around Fort Christina (today - Wilmington) and the area became known as the "**New Sweden**"

Arizona - "**Grand Canyon State**" - was the 48th state of the United States. The region is primarily associated with the world-famous Grand Canyon. That is why that state has such a nickname.

Washington is the state named after the first president. But it has second name - "**Evergreen State**" -because most of the territory of the state is covered with pine forests, and thanks to plentiful rains, grass and bushes remain green all year round.

North Carolina is called the "Tar and Turpentine State." This is because many workers went barefoot. They did turpentine from tar and black sticky gum stuck to the soles of their feet.

Indiana's area of 94.3 thousand square kilometers is called "**Hoosier** state", because the official nickname of locals is Hoosier

California - hilly semi-deserted state, where there are almost no rivers and lakes, is known as the "**Golden State**" because of the Gold Rush in 1848.

The nickname of **Missouri** is "**Show me**." According to one version, the state got its name thanks to the member of the House of Representatives Willard Vandiver, who said at a dinner party in Philadelphia in 1899: "I come from a state where are cultivated cereals, cotton, cocklebur and Democrats, empty oratory neither convinces nor satisfies me. I'm from Missouri. Show me." This phrase was greatly contributed to his popularity and gave Missouri an unusual nickname.

Nicknames of six states are associated with animals from the states' area. Michigan is "Wolverine State". Wisconsin is "Badger State"; Minnesota - "Gopher State"; Oregon - "Beaver State"; North Dakota earned the nickname "Flickertail State" because of a special type of ground squirrel, South Dakota - "Coyote State": Coyote is a prairie wolf.

In conclusion, I would like to say that the most common way of creating nicknames is wealth of natural resources of individual states, their geographical location, names of plants and animals. And I wrote in my report about the states whose nicknames seemed to be very unusual. © Николаенко Богдан, 2016

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Studying abroad (Обучение за границей)

Nowadays everyone wants to get a quality education and moreover, it's hard to decide where you will get it. It is very important not to make mistakes and to choose exactly what you need. In addition to Russian universities there are many different educational courses and training programs abroad.

Studying abroad is the act of a student pursuing educational opportunities in a foreign country. Studying abroad becomes increasingly popular and gives you a lot of possibilities to improve your knowledge of language, to find new friends, to get a lifetime experience and to enhance professional skills.

There is a great variety of programs of studying abroad; all of them are focused on education in a particular field. It can be language and specialized courses, children's vacation programs, as well as secondary and higher education programs. Of course, studying abroad is very expensive but there are also grants and scholarships specifically for students who want to study overseas. Additional terms are knowledge of a foreign language and achievement in their chosen profession. Furthermore, grants are given for short term research program, summer language training, schools and seminars. In addition to these programs there is also a vacation program for children and adolescents.

When studying at school I had a good opportunity to visit Great Britain. I used to go to an English school with my friends and we were invited to visit Oxford for studying English for a month. We were interested in it and our parents supported us. When we landed in the new country for us we were taken to the Oxford College. First of all, we had to write a test to define the level of English and know in which group we'll learn. Then, we were also told the rules, presented the schedule and introduced the staff, then we were carried on to our families. Our classes started at 9 am and ended at noon. The timetable included academic and social activities, and we are looked after by university staff throughout the course.We learned grammar, reading, listening comprehension and practiced oral language, the classes were very interesting, despite the fact that the teachers only spoke English. Also I really liked that there were many foreign people in our group (French, Italian, Spanish, Turkish, Romanian, etc.). It was very interesting to communicate with them and it gave us confidence and helped to overcome the language barrier. Thus, we became good friends and spent funny evenings together. And there was, of course, a good opportunity to get out in London, Stratford-upon-Avon, Bath and Cambridge.

Studying in Oxford improved my pronunciation and gave me an opportunity to feel the culture of the host country. Also, this trip taught me to be more responsible and independent. I think, everybody who has an opportunity to study abroad should try it. It's really worth doing it!

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The British Royal Family (Королевская семья Великобритании)

At present the British royal family is headed by Queen Elizabeth II. The family's surname is Windsor. It was changed from Saxe-Coburg-Gotha to Windsor in 1917.

Queen Elizabeth II was born on 21 April, 1926. Her birthday is celebrated in Britain on the second Saturday of June each year. On this day the parade called "the Trooping of the Colour" takes place.

Queen Elizabeth II came to the throne on February 6, 1952 after the death of her father, King George VI. She was crowned in Westminster Abbey in June, 1953. The Queen lives in the Buckingham Palace.

The Queen married Prince Philipp, Duke of Edinburgh, in 1947. They have got three sons and a daughter.

Their eldest son and the Queen's heir is Prince Charles, Prince of Wales, known as a keen promoter of British interests. He was married to Lady Diana Spencer and has got two sons, Prince William and Prince Harry. The Queen's other children are Princess Anne, Prince Andrew and Prince Edward.

Prince William (Wilhelm) Arthur Philip Louis, Duke of Cambridge (Born June 21, 1982.) is the eldest son of the Prince of Wales Charles and his first wife, Princess Diana, grandson of Queen Elizabeth II. He is the second in line heir to the throne of the United Kingdom.

On November 16, 2010, Clarence House announced the engagement of Prince William and his longtime girlfriend Kate Middleton. The wedding of Prince William and Kate Middleton took place on April 2011 at St Peter's Cathedral at Westminster Abbey in London. Archbishop of Canterbury Rowan Williams has officially proclaimed Prince William and Kate Middleton husband and wife, and by the British Queen Elizabeth II, the young couple is assigned the title of Duke and Duchess of Cambridge. On July 22, 2013 the Duchess Kate gave birth to the son George Alexander Louis. On May 2, 2014 they had their second child, daughter Charlotte Elizabeth Diana.

Prince Henry of Wales (Henry Charles Albert David Mountbatten-Windsor, born September 15, 1984, Paddington, London.) is the youngest son of Prince Charles of Wales and Diana, Queen Elizabeth's grandson.

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The Council of Europe (Совет Европы)

The Council of Europe is an international organization promoting cooperation between its members and European countries in the areas of human rights, democratic development, the rule of law and cultural cooperation. It consists of 47 States in which there are more than 800 million people.

The Council was established on 5 may 1949. Statute of the Council of Europe was signed in London by ten States.

The Council of Europe was established to:

-protect human rights and the rule of law;

-achieve the pan-European arrangements, contributing to the harmonization of social and legal practices of member States;

-promote the unity of the people, by combining spiritual values

Structure of the main organs of the Council of Europe includes the Committee of Ministers (Committee of Ministers), parliamentary Assembly (PACE), the Congress of local and regional authorities of the Council of Europe (the Congress, by May 2007 - CLRAE.) and the European Court of human rights (ECHR). The Committee of Ministers (the Committee) is a decision-making agency, which represents the Ministers of foreign Affairs of the 47 member States of the Council of Europe. The parliamentary Assembly (PACE) brings together 636 members (that is 318 representatives and 318 deputies), appointed by national parliaments, endowed with Advisory functions. Annual session of PACE takes place in the last week of January, April, June and September. The Congress of local and regional authorities of the Council of Europe (Congress) consists of 318 elected representatives of the local and regional levels of government and the same number of their deputies. The Congress, like PACE, has a consultative function. The main objectives were the development of local democracy and the interregional cooperation in Europe.

The European court of human rights (ECHR) in Strasbourg is a control mechanism of the Convention on the protection of human rights and fundamental freedoms. It consists of judges, whose number corresponds to the number of the states-parties.

The Secretariat-General consists of 1,800 employees. Thorbjorn Jagland was elected Secretary General of the Council of Europe in 2009.

The most important achievements of the Council of Europe is the abolition of the death penalty, the strengthening of human rights, the fight against racism and protection of the rights of women and children. In 2002, the Council of Europe adopted the Protocol to abolish the death penalty, also the Council of Europe created the Convention on combating violence against women and children, the Convention on the protection of children from exploitation and many others.

Thus, in considering the duties of the Council of Europe, we can conclude that it plays an important role in the current political situation, performing important functions and tasks.

The Council of Europe is the oldest international organization, whose primary objective is the construction of a Europe based on the guarantees of rights, freedoms and democracy.

Established in 1949, the Council of Europe has become the second organization after NATO based on the results of the Second World War and designed to work for the consolidation of the European countries. However, necessity of its creation has been expressed already in 1940-ies. Therefore, the Prime Minister of great Britain Winston Churchill in a broadcast to the nation in 1943 stated the need for the establishment of the Council of Europe and Council of Asia. At that time, the Council was required, as the organization to join and protect Europe. How effective is the Council now? It can be regarded as a problem of functioning of the Council of Europe, as at the moment we seldom hear in the media about the activities of the Council for the protection of Europe, it does not carry this function and typically is not responsible for the present situation in Europe. In my opinion, the Council of Europe is not a Central organization to address issues in Europe that leads to non-consolidated cooperation between the countries now.

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BRICS: opportunities and challenges (БРИКС: возможности и вызовы)

BRICS is an abbreviation of association of five main developing national economies: Brazil, Russia, India, China and Republic of South Africa. The group was originally known as "BRIC" before inclusion of South Africa in 2010. The Russian side has acted as the initiator of creation of the association. The basis of influence of BRICS on the international scene is made by the growing economic power of the State Parties, their value as one of the main driving forces of development of global economy, considerable population and existence of rich natural resources.

The most important joint steps taken by the states of BRICS in 2009-2014 were development of a common position on a number of regional problems, such as Libyan, Syrian, Afghan, the Iranian nuclear program and also on financial and economic questions as the reform of the World bank and International Monetary Fund, participation in replenishment of credit resources of the IMF for strengthening of its anti-recessionary potential, the creation of the mechanisms of bankscooperation,Allianceestablishment of the exchanges of the countries of BRICS.

Heads of the countries of BRIC gathered for the first summit on June 16, 2009 in Yekaterinburg. The second summit of country leaders of BRIC took place on April 15 — 16, 2010 in the capital of Brazil. The third BRICS Summit took place on April 13 — 14, 2011 in the Chinese

resort of Sanya located on the island of Hainan. The 4th summit took place in the capital of India — New Delhi.The 5th BRICS Summit took place in Durban, the Republic of South Africa.The 7^{th} BRICS Summit took place in Ufa, on July 8 — 10, 2015.

The main goals of BRICS: 1. Maintaining the international peace and safety. 2. Development of multilateral financial cooperation, reforming of the international monetary system. 3. Strengthening of cooperation of the countries of BRICS in the trade and economic sphere. 4. Expansion of cooperation of the states of BRICS in the so-cial sphere. 5. Deepening of humanitarian interaction in the format of BRICS.

Despite the growing progress of the countries of BRICS, it faces various problems in this organization. Firstly, as the structure of BRICS isn't uniform, between countries there is a set of distinctions in different social life. For example, there are differences in financial systems: the systems of China and India which were more closed than at Russia, Brazil and the Republic of South Africa, and it complicates elaboration of uniform activity in the economic sphere. Secondly, it is geographical factor. Countries located on three different continents, it's creates a language barrier and can complicate process of trade between the countries. Thirdly, members of countries of association have different views on further formation of world system. Fourthly, the demographic state in the countries differs, so the problems facing members of group in the field are various, and their decisions are various. However, despite problems, for the countries BRICS is also a set of factors of unity about which it is impossible to forget.

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Michael Jackson (Майкл Джексон)

Michael Joseph Jackson (August 29, 1958— June 25, 2009) is an American singer, songwriter, dancer, choreographer, actor, philanthro-

pist. The most successful performer in the history of pop music, known as the "King of pop", winner of 15 Grammy awards and hundreds of other awards.

The number of Jackson's sold records worldwide is 1 billion copies. In 2009 he was officially recognized as "the American Legend and Icon of Music".

Jackson began performing at Christmas concerts from the age of five. In 1964 Michael joined "The Jacksons" — a group created by their brothers Jackie, Tito and Jermaine. But soon he started singing solo. The first well-known album from Michael Jackson "Off the Wall" was released in August 1979 and the best-selling album was "Thriller", released in November 1982.

On May 14, 1984, in the White House, Michael received an award from the US President Ronald Reagan for his charitable work that helped people to overcome alcohol and drug abuse.

27 January 1984 — was the day that changed everything in M. Jackson's life. He and his brothers starred in commercials for Pepsi. During the filming his hair caught fire from the pyrotechnic devices and Michael got 3rd degree burns on the scalp. While in hospital, Michael visited a children's burn unit, and instead of receiving multimillion-dollar compensation from the Pepsi Company, he opened children's burn center. This was the beginning of Michael's charity work which he continued until the end of his days.

In addition, after the accident Michael had his first plastic surgery to restore the damaged skin and scalp. After that he had nose and chin surgery. All this combined with a vegetarian diet, and weight loss led to significant changes in the appearance of the singer.

In 1989 at the Soul Train Music Award ceremony Elizabeth Taylor called M. Jackson "the true king of pop, rock and soul", thus the unofficial title "the king of pop" was given to M. Jackson forever. Because of the increased attention Jackson spent most of his time in seclusion with his children whom he loved dearly.

In the following years M. Jackson released a lot of albums: "Number Ones", "Michael Jackson: The Ultimate Collection", "Dangerous" and others.

M. Jackson had to stand trial - he was accused of molesting minors, but after a long trial was found not guilty.

In March 2009 M. Jackson announced that he was going to give a series of concerts in London called "This Is It Tour". But, unfortunately, he was unable to make dreams a reality. On June 25 2009 M. Jackson died at Medical center of the University of California.

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Culture of New Zealand (Культура Новой Зеландии)

British culture has greatly influenced the cultural life of New Zealand, as well as cultural traditions of many countries of Western Europe, whose inhabitants moved to New Zealand. Simultaneously, the importance of local cultural principles of the Polynesian people is invariably high. This fact is most clearly expressed in the case of the Maori people. Indigenous people of Samoa, Fiji and Tonga have also played a significant role in the spread of New Zealand Polynesian culture.

Writing appeared in the country only with the arrival of the first settlers from Europe. Janet Frame and Katherine Mansfield were considered to be he most popular writers. Classic genres of literary creation in New Zealand are a short story and a story.

Clearly pronounced architectural style of New Zealand (NZ) began in the late 19th - early 20th century. Even the very first NZ buildings were significantly different from the similar British and Australian buildings in style. The reasons should be sought in the low population density and remoteness. Huge reserves of stone suitable for construction, made the country give up wood in the construction. The most interesting architectural monument of New Zealand is Napier downtown. In 1931the city was destroyed by the earthquake, but was soon restored. Napier center facilities (in art-deco style) reached our age intact, and have been recognized as a world cultural heritage by UNESCO. TV Sky Tower, 328 meters high, which was built in Auckland in 1997, became the most famous piece of architecture and building technology in New Zealand, being the highest building not only in the country, but in the whole southern hemisphere as well.

One of the most important elements of Maori culture is kapa haka. It includes the whole system of dance, movement and facial expressions. And all this is accompanied by singing. Traditional kapa haka dance includes several directions. Firstly, it is the male dance haka (Maori - Haka), which became famous for All Blacks' performances (national New Zealand rugby team) before matches. Secondly, it is a female dance Poi (Poi), better known today as the performance of juggling balls, attached to ropes. Haka has become a constant attribute of all public and state ceremonies. In sports clubs throughout New Zealand one can meet various customized versions of haka. The naval and army units have their own version of haka.

Many of New Zealand artists have achieved international recognition and success. Opera stars: Dame Kiri Te Kanaua and Dame Malvina Major; filmmakers Jane Campion and Peter Jackson and actor Sam Neill are only a few examples. The producers of the best foreign stage productions and performances include New Zealand in their tour calendar, because they know that enthusiasm and support of New Zealand audience is guaranteed. Every two years, Wellington hosts International Arts Festival.

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Yury Gagarin

On April 12, 1961, Yury Gagarin made history by being the first human to orbit the earth.

As a precaution, engineers at the Soviet Academy of Sciences had an onboard computer, as well as mission control steer the craft, "Vostok 1". They did this because they feared that being in the weightlessness of space, you might be disabled or not be able to move very much. He wouldn't need any food for his single orbit trip, but scientists wanted to know if he could eat in the weightlessness of space.

Before Gagarin climbed aboard the rocket, he made a speech. His speech said things such as how beautiful a moment this was, to go into space. He was glad to, "meet nature face to face, in an unprecedented encounter."

As Gagarins rocket accelerated towards space, it reached a peak of 5 g's, meaning Gagarin felt five times heavier that his normal weight.

As Gagarin passed through the lower atmosphere, the nose pointed canopy separated, exposing the "Vostok 1" capsule, allowing Gagarin to see the dark blue sky turn into a black space as he was shot into orbit, around the earth.

14 minutes after liftoff, Gagarin reported," Separation from the carrier rocket completed" Gagarin tested his food and water samples. He reported no side effects to the weightlessness. As Gagarin passed over the Atlantic, he thought of his mother and how she would react to the news of the first space flight... especially since her son was the one up there flying it. She was unaware about Gagarin being involved in space exploration until the news broke.

At about 10:15 a. m., just after Gagarin started passing over Africa, the autopilot turned "Vostok 1" around and fired the rocket, which would take Vostok 1 out of orbit. This was a very suspenseful and nervous time for Yury Gagarin and mission control, for two out of the five test flights, the rockets did not fire correctly and the flights ended in failure.

Luckily, this time, it worked correctly and Vostok 1 came out of orbit and was slowed down by 350 miles per hour. As the capsule came out of orbit, the equipment section was dropped, because it was no longer needed. Now all that was left of the 125-ft. rocket, launched just over an hour ago, was a 7 1/2-ft diameter capsule. As it fell 17,000 mph. towards earth, Gagarin experienced 10 gs, and felt like a 1,500-pound brick falling from the sky.

With a flight time of about 1 hour and 48 min., Gagarin landed safely in Siberia.

Years later, Gagarin was tragically killed in a test plane crash.

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Anglo-Indians (Англо-индийцы)

The definition of an Anglo-Indian can now denote any mixed British-Indian parentage, but for many its primary meaning refers to people of long mixed lineage, dating back up to 300 years into the subcontinent's colonial past.

In the 18th century, the British East India Company followed previous Dutch and Portuguese settlers in encouraging employees to marry native women and plant roots. The company would even pay a sum for every child born of these cross-cultural unions.

By the late 19th Century, however, after the Suez Canal's construction had made the long journey shorter, British women were arriving in greater numbers, mixed marriages dwindled and their offspring came to be denounced by many Indians as "Kutcha-Butcha" (half-baked bread).

When the British finally departed in 1947 they left behind a Westernised mixed-race subpopulation about 300,000-strong who weren't necessarily glad to see them leave.

They began leaving in droves in the 1950s and 1960s, dispersing throughout Commonwealth countries of Canada, Australia and New Zealand, and their "motherland", the UK.

It's uncertain how many Anglo-Indians remain in India, uncounted since a 1941 census. But the estimated 125,000, living mostly in Calcutta and Madras, are enacting the same assimilation - marrying Indians and adopting their culture. They are becoming indistinguishable.

There are many who want to preserve the Anglo-Indian identity in India. Charles Dias, the parliament's Anglo-Indian representative, has campaigned for greater government support, including reserved university places, new cultural centres and a fresh caste census. An online international marriage portal is being launched in Kerala, enabling youngsters worldwide to marry within the diaspora.

It has been noted in recent years that the number of Anglo-Indians who have succeeded in certain fields is remarkably disproportionate to the community's size. For example, in the music industry there are Engelbert Humperdinck (born Madras), Peter Sarstedt (Delhi) and Cliff Richard (Lucknow).

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The early development of American television (Раннее развитие американского телевидения)

Few inventions have had as much effect on contemporary American society as television. Before 1947 the number of U.S. homes with television sets could be measured in thousands. By the late 1990s, 98 percent of U.S. homes had at least one television set, and those sets were on for an average of more than seven hours a day.

Electronic television was first successfully demonstrated in San Francisco on Sept. 7, 1927. The system was designed by Philo Taylor Farnsworth, a 21-year-old inventor who had lived in a house without electricity until he was 14. While still in high school, Farnsworth had begun to conceive of a system that could capture moving images in a form that could be coded onto radio waves and then transformed back into a picture on a screen. Boris Rosing in Russia had conducted some crude experiments in transmitting images 16 years before Farnsworth's first success. Also, a mechanical television system, which scanned images using a rotating disk with holes arranged in a spiral pattern, had been demonstrated by John Logie Baird in England and Charles Francis Jenkins in the United States earlier in the 1920s.

RCA, the company that dominated the radio business in the United States with its two NBC networks, invested \$50 million in the development of electronic television. To direct the effort, the company's president, David Sarnoff, hired the Russian-born scientist Vladimir Kosma Zworykin, who had participated in Rosing's experiments. In 1939, RCA televised the opening of the New York World's Fair, including a speech by President Franklin Delano Roosevelt, who was the first president to appear on television.

Early television was quite primitive. All the action at that first televised baseball game had to be captured by a single camera, and the limitations of early cameras forced actors in dramas to work under impossibly hot lights, wearing black lipstick and green makeup (the cameras had trouble with the color white). The second network became the new American Broadcasting Company (ABC), which would enter television early in the next decade.

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English-speaking countries: the United States of America (Англоязычные страны: Соединенные Штаты Америки)

There are several countries in the world where English is the native language. These countries are the United Kingdom, the United States of America, Australia and New Zealand. English is also one of the official languages in Canada, the Irish Republic and the Republic of South Africa. Although these countries are situated in different parts of the world, they all share the same language.

The US is the state with rich cultural heritage and fascinating history. It has passed a long way of formation and has earned respect from other countries. During World War II the US had been a reliable support for the Soviet Union because it had helped much in the fight against the fascism.

America gave the world a lot of great people, such as Abraham Lincoln, James Fennimore Cooper, Ernest Hemingway and Martin Luther King. This list is endless. We should not forget about Christopher Columbus because he had discovered this previously unknown continent.

The Statue of Liberty is the symbol of American democracy. It stands on Liberty Island in New York. It is one of the first things people

see when they arrive in New York by sea. This National Monument was a present from France to the USA. France gave the statue to America in 1884 as a symbol of friendship. Liberty carries the torch of freedom in her right hand. In her left hand she is holding a tablet with the inscription "July 4, 1776" American Independence Day.

Americans like to think the United States is a young country but really it has a long and interesting history. You can see some of its history in the styles of the houses. The lovely pueblo houses of Native American villages, the old pioneer log cabins, the plantation houses in the South, the beautiful colonial homes of the Northeast — they are all a part of American history. They are a part of modem America too because people copy the old styles in new houses. Almost all famous American composers belong to the 20th century and include such names as Charles Ives, Aaron Copland, Samuel Barber, Roger Sessions and Virgil Thomson. Edgard Varese and John Cage have gained fame as experimental composers.

In the 1960s some British groups, especially the Beatles and the Rolling Stones, became internationally famous. Since that time, rock has incorporated folk music, soul music has developed, and many social phenomena, such as drug culture, the civil rights movement and the peace movement have found their expression in rock music.

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Celebrations in the USA (Праздники в США)

The population of the USA is made up of people of different nationalities. Centuries ago they brought with them their native celebrations. Some holidays which are marked in the United States originated in America. The number of holidays is different in different states-from 8 in the District of Columbia to 20 in Oklahoma. But the most important holidays are celebrated throughout the USA. They are: New Year's Day(January 1), Lincoln's Birthday(February 12), Washington's Birthday(February 22), Independence Day (July 4), Thanksgiving Day(fourth Thursday in November), Christmas(December 25). Here are a few words about them.

On New Year's Day people see the old year off and the New Year in. Most people stay up all night, even children. At midnight many people go outside and shout "Happy New Year!" Some people set off fireworks and blow automobile horns which are heard everywhere. Everybody exchanges presents and good wishes. Offices, factories, banks and stores do not work on this day.

Washington's birthday is marked on February 22. George Washington led the American Army to victory in the War for Independence. Later he was elected President of the United States and was in office for 8 years (1789-1797). The national capital of the United States, a state and several towns are named after George Washington.

One of the greatest holidays is Independence Day. On July 4, 1776, the Declaration of Independence was signed. It proclaimed independence of the thirteen British colonies from Great Britain. July 4 has become the greatest holiday since. In the past this day was marked with big parades and fireworks, but now it is celebrated more quietly. Cities and towns are decorated with flags on that day, there are parades in some places, but most people just go on picnics to the countryside.

Thanksgiving Day is marked on the fourth Thursday of November On this day the Americans honour the memory of the first settlers. It also marks the end of the harvest season. It is a long-standing tradition to make a festive meal with a fried turkey on this day.

Christmas is a religious holiday which symbolizes the birth of Jesus Christ. By this day people decorate fir trees with toys and candies. Children wait for Santa Claus who comes to every house and brings them presents. Before going to bed, children leave their shoes to find in them what they want most of all the next morning. Some people, especially young people, like to celebrate it in restaurants and cafes and pubs, but most people prefer to stay at home with their family on this day.

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British Cuisine (Британская кухня)

Traditional British cuisine is usually described as plain, conservative and unvaried. The popular joke says that it's the worst cuisine in the world; moreover, the British themselves often say so. Indeed, classic British dishes are not too delicious, but they are nourishing, natural and tasty. Much attention is paid to the food quality. The British prefer local food to imported products, so, nearly all fish, milk and meat products are produced within the country and vegetables are grown by local farmers.

A characteristic feature of British cuisine is conservative cooking. The British prepare dishes with little or no hot spices and sauces, and if used for seasoning dishes, it's often a lot of acidic spices which are served in bottles and have been used since the dish is ready.

Britain boasts a great choice of cold appetizers, the most popular of which are, of course, sandwiches. Soups are served seldom. For preparation of meat dishes practically all types of meat - veal, beef, pork, and mutton are used. Meat can be baked entirely with blood or cut on stakes and fried on a frying pan. Baked vegetables particularly potatoes and also various sauces for a garnish to meat dishes can be served. Mint sauce is made from water, sugar, wine vinegar and small cut mint leaflets. Favorite national dishes are the beefsteak and roast beef. The real roast beef is covered with a crisp while inside it has to remain juicy and pink. Pork pies, a mutton foot, kidney paste, etc. are also popular. In addition such traditional dishes as potato baked puddings with mutton, ground beef or fish enjoy popularity and are considered as the business card of Great Britain. Generally there are puddings of two types: unsweetened (vegetable, meat and grain) which replace second course, and sweet which is served as a dessert. Some traditional dishes of English cuisine are served only on holidays. The most popular of such dishes is the Christmas plum pudding which is prepared from grain crumbs, fat, raisin, flour, eggs, sugar and various spices. Before serving the pudding is poured with rum, then, a cook lights it on fire. The fire burns the sugar on the surface to make a sweet crust.

As for drinks, of course, it's impossible to imagine British cuisine without tea. Tea is not always served with milk. The British drink tea with and without sugar, with lemon, ginger, cinnamon, honey and so on. But tea with milk is a classic combination.

As for alcoholic drinks British prefer to drink beer – malt liquor and black ale. British also drink rum, gin, whisky and port.

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Queen Elizabeth II (Елизавета II)

Elizabeth Alexandra Mary - is the full name of the Queen, who was crowned at the age of 26 when her father, King George VI, died while on an official tour of Kenia in 1952.

Quite a number of Brits consider being the queen a very difficult job which prevents you from having a normal lifestyle. By the way, the majority of people in Britain think the Queen is doing her job of representing Britain around the world excellently and very professionally. In her country she does charity work and participates in various events of symbolic importance.

As a princess, Elizabeth II tried to lead as «normal» life as possible in her situation. She was allowed to play with other girls and she never showed she was superior to them. She even bought shoes for one of her friends who were very poor. Princess Elizabeth enjoyed acting, too. With her younger sister Margaret and the children of the staff of the Royal Household she staged pantomime at Windsor at Christmas.

During the Second World War she joined the Armed Forces, the first female monarch to do so, and helped drive and repair military trucks. Just imagine: the Queen driving or repairing a military truck!

Elizabeth II was lucky to have found a man whom she truly loved and worshiped, for her he was the one. His name was Philip Mountbat-

ten, now Prince Philip, the Duke of Edinburgh. They say in his youth he was rather a reckless man – he used to drive his car too fast and Elizabeth even got in a car accident with him once. His clothes weren't very tidy and Liz's family complained that he didn't have polished shoes and an elegant suit and behaved himself in an unduly familiar manner, sometimes he was just rude. But he also was a handsome young man and Elizabeth loved him anyway, she loved him as he was. Her parents were not too happy to have Philip as a son-in-law, but they didn't want their daughter to be unhappy, so the marriage took place in 1947, when the would-be queen was twenty-one.

Always keeping a brave face throughout the trials and tribulations of her reign, Elizabeth II is a role model for British public figures and commoners alike.

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Vie des étudiants en France (Студенческая жизнь во Франции)

Après le baccalauréat 85 % des étudiants poursuivent leurs études à l'université. Plus de deux millions d'étudiants sont inscrits dans l'enseignement supérieur et 75% d'entre eux fréquentent les 90 universités françaises. L'enseignement supérieur est gratuit, les étudiants paient environ 230 euros pour la Sécurité sociale et les frais administratifs.

Parmi les pays développés, la France arrive en 3e position pour le nombre d'étudiants par rapport à la population, après le Canada et l'Espagne. L'étudiant qui vient d'obtenir son baccalauréat peut rester au lycée et préparer en deux ans un BTS (brevet de technicien supérieur) ou il peut se diriger vers les IUT ou les Grandes Ecoles mais la plupart d'entre eux vont à l'Université.

La grande majorité des bacheliers entre à l'université. Il y a plus de 1500 000 étudiants dans les universités françaises.

Les universités sont ouvertes à tous les étudiants titulaires du bac mais les étudiants doivent, sauf exception, s'inscrire dans leur académie d'origine, au moins pour le premier cycle. Les universités les plus fréquentées sont celles de Lettres et de Sciences humaines.

Les étudiants possédant une licence et souhaitant devenir enseignants, peuvent entrer à l'IUFM (Institut universitaire de formation des maîtres) et se présenter à un concours de recrutement comme le CAPES ou l'agrégation s'ils sont titulaires d'une maîtrise. Le DEUG, qui se prépare en deux ans, n'est obtenu que par 28% des étudiants à l'issue de la 2e année. La majorité des étudiants inscrits dans cette filière effectuent une année supplémentaire. Les étudiants peuvent se loger dans les résidences universitaires gérées par le CROUS mais dans certaines académies leur nombre est insuffisant et les étudiants choisissent alors d'habiter dans des foyers privés ou de partager des appartements. Les repas sont pris au restaurant universitaire pour un prix modique. Les étudiants dont les parents ont des ressources insuffisantes peuvent bénéficier d'une bourse d'études. Un étudiant sur cinq est boursier. Cette aide annuelle s'élève au minimum à 111 euros environ et au maximum à 3 006 euros. Si le budget des étudiants est globalement en hausse, une étude récente montre que de plus en plus d'étudiants vivent en dessous du seuil de pauvreté. En effet, la démocratisation de l'enseignement a ouvert les portes de l'université aux enfants des classes moyennes et défavorisées, et les familles n'ont pas toujours les moyens financiers de les faire vivre confortablement.

Les étudiants de DEA ou de DESS peuvent aussi obtenir des bourses sur critères universitaires et elles se montent à environ 3 289 euros par an. Tous les étudiants possèdent une carte qui donne accès gratuit aux bibliothèques universitaires et qui leur permet de bénéficier de réductions dans différents lieux: cinémas, musées, théâtres, librairies, ciné-clubs, clubs sportifs etc.

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Mary Poppins (Мэри Поппинс)

Books about Mary Poppins, the first of which came in 1934 year, have gained immense popularity in English-speaking countries and in the rest of the world.

In the Soviet Union the now popular novels about Mary Poppins were translated by Boris Zakhoder.

Mary Poppins – the heroine of the books for children written by Pamela Travers – is the nanny-fairy, who was invited to babysit with children in a London family.

The writer Pamela Travers created the image of an "ideal nanny." Mary Poppins – the unremarkable-looking young woman ("She was thin, with large hands and feet and small blue eyes that seemed to auger through you"). She is a woman of sophisticated manners and accuracy, her shoes are always polished, her apron is always starched, and she smells of Sunshine» soap and toasts. All her belongings are an umbrella and a large carpet (Tapestry) bag. She has an amazing talent to make an adventure out of nothing. Mary taught children the two most important things in life: the ability to see fabulous things in common and not to be afraid of any changes. One more mysterious fact about her is that she asked very little money for her service.

Mary Poppins appears in a very special way – she comes with the wind, which she calls the "wind of change".

Mary Poppins is quite strict, despite that, both children and parents love her very much.

The name of this famous English nanny became known all over the world as the synonym to "a very good nanny governess". Children's entertainment centers and cafés, fashionable women's clothing brand and style of dress are all named after Pamela Travers' character.

As a child I used to love the stories about Mary Poppins, as a matter of fact I still do hope that such nannies exist somewhere, women who love children and want to make them really happy.

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My favorite holiday – The Victory Day (Мой любимый праздник – День Победы)

Victory Day is especially important for everyone and in this respect I am not an exception. This is a day of memory and of pride for our country, for the people who gave their lives for us to live under a peaceful and bright sky. The 9th May is a real holiday for me, for my family, for my city and for Russia in general.

My grandparents were born during this terrible bloody war. My grandfather was born in Leningrad, but, fortunately, he was not in the city during the blockade. My grandmother is from Tataria, from the city Leninogorsk. They were quite children when our country was attacked by the enemy - the Fascist Germany. The shades of this cruel time remained forever in their children memory. My grandmother often told me that her family had been starving. They ate grass, cooked soup of rotten potatoes and a piece of bread was divided by several people. They went barefoot erasing legs to blood because they had no boots. Our grandparents have experienced the ordeal.

During this holiday all of us watch a parade on TV. Every year I go to the Victory Park to see the event dedicated to the Day of Victory over fascism. Three years ago I wanted to celebrate the 9th May in a special way. I bought a lot of carnations and gave them to the veterans.

It became my tradition. Now every Victory Day I proudly and respectfully attach a ribbon of St. George on my chest near my heart. I buy carnations and go to congratulate people who helped to preserve our lives and freedom.

Handing flowers to the veterans, I congratulate them with this Great Day, the day of the Victory over the German invaders, and they congratulate me in response. The veterans wish us health and they also want our generation not to see any war in our lives.

In 2015 we celebrated the 70th anniversary of the Great Victory. According to the tradition, I went to congratulate the veterans dear to my heart. In spite of bad weather the mood was on top. We sang and

danced together with the veterans, saw happy smiles on their faces, and we felt warmer. To my surprise, I met an old woman who I had congratulated exactly two years ago, we were very pleased with this event. I would like once again to congratulate everyone with the 70th anniversary of The Great Victory and express my gratitude to Soldiers and home front workers, to thank them for our happy life, the life in which there is no enemy, whom we called the fascism!

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Les particularités culturelles de la France, leurs influence sur la communauté mondiale (Культурные традиции Франции и их влияние на мировое сообщество)

La culture française se développait de nombreux siècles. La culture de la France s'est composée de différentes cultures et civilisations anciennes, y compris grecque, romaine, celtique, et d'autres. La mise en forme, la culture a subi l'influence des pays voisins et des événements historiques. La France a beaucoup contribué au développement des cultures des autres pays dans le domaine de la mode, de l'art contemporain, du cinéma et de la cuisine. La France est un des pays les plus emblématiques du monde. Par conséquent, même la plus petite ville de la France a son propre blason, la devise et le drapeau. Chaque personnage a sa propre histoire, et répond exactement aux lois héraldiques.

La langue officielle est le français. Les Français pensent que leur langue est la partie la plus importante dans l'identité culturelle. En outre, le pays utilise encore 75 langues régionales, le plus commun d'entre eux est le dialecte Catalan, la langue utilisée par les habitants des Pyrénées. Toutes les langues régionales sont reconnues par la Constitution française et enseignées dans les écoles comme la seconde langue dans les régions où ils sont communs. Dans tous les aspects de la vie on peut voir que les Français défendent leur identité. Dans les villes, toutes les inscriptions et signes sont seulement en français y compris le secteur touristique et il n'y a pas souvent de traduction dans les autres langues. Parce que les Français considèrent leur langue la plus appropriée pour la communication internationale. Le conservatisme de la société française vient des temps anciens, avec une histoire longue et influente. Les normes françaises dans la société et les différentes traditions sont devenues classiques.

Les Français gardent et protègent leurs traditions. Ils les transmettent de génération en génération, et forment leur propre style de vie. La famille pour les Français est très importante. Et ils ont une tradition de tenir un conseil général dans lequel toutes les generations de la famille sont presents. Dans de nombreuses familles, les parents parlent les uns aux autres en utilisant «vous» toute la vie.

La France du XXI siècle se caractérise par le souci de la préservation des valeurs nationales. La France est le centre du monde et de la culture. Ses futurs citoyens voient dans la nouvelle Europe les perspectives dans la formation et dans le fonctionnement des institutions trans-européennes.

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Halloween - the night of ghosts, pumpkins, sweets and divination (Хэллоуин — ночь привидений, тыкв, гаданий и сладостей)

From October 31 to November 1 in different countries around the world people celebrate one of the most funny, mystical and mysterious of holidays. This holiday is one of the oldest in the history of mankind, although it is so popular not so long ago.Such original holiday is my favorite! And I want to tell you about it.

Halloween is the holiday of vampires, witches, ghosts and other evil spirits.

Across all Europe this night marked transition to the winter. They think that at this time souls of the dead visit the former houses to get warm at fire. They wander around, collecting donations of food and drink at other members of a family. Souls of the dead could accept different appearances – malicious were installed in animals. Together with them there are also other powers of darkness: demons, house witches. All evil spirit goes down on the earth. Because of fear, people didn't light the fireplaces in the houses and dressed up as terribly as they can – in animal skins and heads, hoping to scare away evil ghosts.

Over time, Halloween has become a reason to have fun for everyone: for adults and for children. It attracts primarily for its trappings – mysterious costumes, pumpkins, divination, the general atmosphere of mysticism and mystery. Children dressed in costumes go from house to house, singing songs in hopes of getting a treat from the owners. This action is called «trick or treat».

A traditional Halloween game is the Apple bobbing. In a bowl or a bowl of water they dip the apples, which the participants are supposed to catch with theur mouths without using hands. The winner is whose catch is the biggest. Looking in the mirror in the candlelight to see your destiny, communication with spirits through various kinds of magic whiteboard, getting out of the box pre-written predictions are the main fun of this most mysterious of all the holidays.

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Main issues of the League of Arab States (Основные проблемы Лиги Арабских Государств)

The League of Arab States or Arab Leagueis an organization of countries where Arabic is an official language. It consists of 21 members (with Palestine regarded as an independent state).

The LAS was set up in March 1945 just before the end of World War II. Headquarters of the LAS is located in Cairo, Egypt.
The effectiveness of the LAS has been questioned by member states several times. During the Cold War one part of the LAS were oriented on the USSR, while others got along with the Western camp. For this reason countries had rows for leadership. For example conflicts between Egypt and Iraq.

In the XX century many countries changed their government form. After that many contradictions between old monarchies (Saudi Arabia, Morocco) and new republics (Egypt, Libya) escalated at once.

The main issue of the LAS is the US-led attacks on Iraq and incitements to war. Some member states opposed it, while others stood aside.

In the beginning of 2011 the LAS faced with the "Arab spring". The organization has shown an inspiring sense of purpose. The LAS stopped the UN action against Muammar Gaddafi in Libya.

Sometimes members have to agree on the same issues, for example, to support the Palestinians under Israeli occupation.All members of the LAS decided to block Israel economically and politically.

The LAS effectiveness at lower levels is significantly higher. It is trying to introduce new technology to poor areas. The LAS has helped to create a regional telecommunications union.

Of course, members of the LAS have relationship not only between each other. The LAS has the policy that helps its countries to get on with many states. For example, Latin economics are hungry for Arab oil and petrochemicals. For this reason last year the LAS promoted selling Brazil its oil for \$ 2 billion.

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Internet: Pro et contra (Интернет: за и против)

Nowadays you hardly find a person who hasn't heard about the Internet. It has taken a strong place in our life and our minds. First Internet has been created for the needs of military. Within 20 years Internet has spread all over the world. Internet has been called the Great Web for a reason.

With the rapid development of technologies now almost every ordinary family has the access to the world's global information. With the help of only one mouse click you can find yourself in the middle of global events. And due to the big quantity of web cameras around the world you also have an opportunity to travel without leaving your house. More and more persons now work in the Internet. A lot of people replace long queues in shops with online shopping where you can easily buy everything what you want with no efforts.

Here the question arises. Is Internet Good or Evil? On the one hard convenience has become extremely important in over life. Our life is too fast and for the purpose to get accommodated to such huge speed people try to make life as easier as possible. You do not have to wait tillthe end of the week to go shopping for example as you can easily buy all the things you need from the office or house. You can see new films, read new books, play interesting games creating your own worlds there and communicate with friends. And all these things are possible to do without leaving the house. Internet helps us keep up to date.

On the other hand such way of life brings us to rather sad statistics which shows that people have more and more difficulties while communicating with others with each coming day. We become lonely and aloof. We dive into the virtual reality where we think we can do everything and thus we forget about the real world with people surrounding us.Unfortunately, some people become incredibly dependent on it. They live in the, so-called, virtual reality, forgetting about their everyday responsibilities.

In recent years, experts more and more often speak about a new mental illness - the so-called Internet addiction. Thanks to it people can literally sit for days at the Network, not noticing the time on the others. Especially it concerns young people. According to some data, a symptom of computer game addiction is now found in approximately 10-14 percent of Russian Teens who spend all their free time in the gaming halls.

Choosing to have Internet in our life, we must remember that too much water drowned the miller

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Marbles (Марблз)

A marble is a small spherical toy usually made from glass, clay, steel, plastic or agate. These balls vary in size. Most commonly, they are about 1/2 inch to 1 inch (1.3 to 2.54 cm) in diameter, but they may range from less than 1/30 inch (0.111 cm) to over 3 inches (7.75 cm). Marbles is one of the gambling and they can be used for a variety of games called marbles. When these wonderful game balls were born?

Various balls of stone were found on excavation near Mohenjodaro. Marbles are often mentioned in Roman literature, Chaldeans of Mesopotamia and ancient Egypt. They were commonly made of clay, stone or glass. It is believed that the first mention of the game belongs to the reign of Queen Elizabeth I (1558-1603).

Ceramic marbles entered inexpensive mass production in the 1870s. A German glassblower invented marble scissors in 1846, a device for making marbles. In 1903, Martin Frederick Christensen made the first glass marbles on his patented machine. His company, The M. F. Christensen & Son Co., manufactured millions of toy and industrial glass marbles. The next U.S. Company entered the glass marble market was Akro Agate in 1911. Today, there are only two American-based toy marble manufacturers: Jabo Vitro in Reno, Ohio, and Marble King, in Paden City, West Virginia.

Every year the pub "Greyhound" in the village of Tinsley green, West Sussex, Angiasthenia Playground gathers people to play marbles. The championship is held on Good Friday. The winner of the tournament receives the coveted title and a silver Cup.

The championship provides both team and single tournaments. Each year the competition attracts about a hundred nonprofessional players, students, regardless of country of residence and age and 20 teams. For many years, along with the Brits in the championship take part the residents of the USA, the Netherlands, France and Germany. The game increases aiming and concentration skills. The game is played on a circular field with a diameter of 2 meters with 49 glass beads that are laid out in the form of Christa. Players are divided into two teams of 6 players, each receives four balls. You can shoot from anywhere outside the circle. If the ball flies out of the circle, the turn goes to another player. The winner is the first team to knock 25 balls out of the field.

The game of Marbles is now recognized by psychologists as one of the many great games not only for adults but also for children! It develops speed, accuracy and fine motor skills. These bright, colorful and sparkling balls also develop the child's sense of beauty, and of course imagination.

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Хабибуллина Карина

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Relations between Russia and the European Union (Отношения между Россией и Европейским Союзом)

Official relations between the USSR and the EU were established on March 2, 1998 and later on December 23, 1991 the European Union recognized Russia as the successor of the USSR and as its trade partner.

The legal grounds for relations between Russia and the EU are based on the partnership and cooperation agreement (PCA) which was signed 22 years ago. These arrangements created a stable legal foundation for the all-round development of the Russia-EU dialogue in various fields. According to this agreement the framework of EU-Russia political dialogue was set up.

Russia is an influential member of the UN Security Council and, taking into account the historical factors and geographical position is one of the key players in the system of All-European neighborhood. The Russia Federation is also a major energy supplier to the EU and Russia is the third largest trading partner of the EU.But, despite the long history of cooperation, negotiations are currently frozen at the initiative of the EU. Russia-EU relations are not simple at the present time. The present situation in Ukraine has complicated to the development of the relations between the EU and Russia. As a result, now some mechanisms of cooperation are temporarily frozen. Earlier some sanctions have been adopted which are directed to encourage Russia to review its activities in Ukraine. These sanctions have damaged the trade and economic spheres of both the EU and Russia, because they badly influence on the world trade balance. Russia has reduced import; hence the European export volumes have been declined. In June 2015 the potential loss of European companies from the anti-Russian sanctions was estimated in the 100 billion Euros. But until 2008 commodity turnover between Russia and the EU was showing the strong growth. Later, we can observe the decline of exports and imports from the EU to Russia from 338 billion Euros in 2012 to 284 billion Euros in 2014.

Thus, the crisis in Ukraine has had the negative impact on the bilateral political dialogue between the partners and the cooperation in the economic sphere between Russia and the EU has been diminished in comparison with previous years.

Despite this, the EU and Russia try to maintain the policy of global cooperation and joint fight against new threats in the sphere of security, terrorism, drug trafficking and climate change, no doubt, even in such situation, Russia is still the territorial partner of EU and strategically important player, which contributes to solving local and global problems.

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Holidays and Celebrations in the United Kingdom (Праздники в Соединенном Королевстве)

Besides public holidays, there are other festivals, anniversaries and simply days, on which certain traditions are observed, but unless they fall on a Sunday, they are ordinary working days. Mere arc some examples. February 14 is St. Valentine's Day; it is a day for choosing sweethearts and exchanging love-tokens. Generations of young people have considered St. Valentine to be the friend and patron of lovers and have sent gifts and hand-made valentines to their sweethearts. Valentine was a colorful card with a short love verse composed by the sender. Now thousands o« readymade valentines are sent through the post every year. They are complete with ready-made sentiments and decorations, brightly colored and gilded and sometimes perfumed and packed into a neat box.

Pancake Day is a popular name for Shrove Tuesday - the last day of enjoyment before the fasting of Lent. On shrove Tuesday Christians confessed their sins to a priest. Many people still traditionally eat pancakes on that day. One of the main events of Shrove Tuesday is the pancake race at Olney in Buckinghamshire. The competitors in the race arc housewives from Olney; they have to make their pancakes and run from the village square to the church.

April, 1 is known in Britain as April Fool's Day - the day when practical Jokes are played. Any person, young or old, important or not, may be made an April Fool between the hours of midnight and noon. Children are, of course, very keen supporters of the traditions. Most of their tricks have now become traditional. One is to tell someone that his shoe-lace is undone, when in fact all is in order. On the first of April you can step in the basin of water, or receive a letter with a deceiving message or invitation. You can have your sleeve or trousers-leg sewn. If you are young and innocent, you can be sent to fetch some non-existing thing like pigeon's milk.

Another popular British tradition is Halloween, celebrated on October 31, the eve of All Saints' Day. Halloween customs date back to a time when people believed in devils, witches and ghosts. They thought that they could do all kinds of damage to property. Some people tried to ward off witches by painting magic signs or nailing a horseshoe. Now most people do not believe in evil spirits. Today the day is usually marked by costume balls or fancy-dress parties and is a popular tradition with young people and children.

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Traditions and holidays in Great Britain (Традиции и праздники Великобритании)

British calendar is flashy with all kinds of holidays: national, traditional, public or bank holidays. The formation of some of them dates back hundreds of years, and it is not great surprise for such country as Great Britain loving its culture and history.

Public or bank holidays require all business and other bank institutions to close for the day and to give the employees a paid day off. They are: Christmas, New Year's Day, Easter, St. Patrick's Day, etc. Traditions respected on these days are various and interesting: for example, on the President's Day girls are to ask boys off for a date, or invite them to a party or to the cinema, or even ask him to marry her. On the St. Patrick's Day people use to wear something green and attend parades.

National holidays are also rich in their traditions and customs. On the Memorial Day people use to invite friends and relatives to a dinner and remember the dead together.

The Midsummer Day, on the 24th of June gives a possibility to visit the Stonehenge – the biggest stone circle, dating back to the 1st century BC, built by Druids, and is considered their calendar, used to count months and seasons.

If you visit the UK on the 31st of October, you can meet witches, wizards, ghosts and different types of evil spirits appearing on Halloween. It is common for people to spend thousands of dollars on dresses, masks and other types of Halloween attributes. The celebration begins long before the 31st. People decorate their houses with pumpkins – they cut out the middle of the pumpkin, cut holes for eyes and mouth and put a candle inside. Some cities make a whole competition and parade of the best pumpkins of all. Children have a special tradition to go to their neighbors and play "Trick or Treat"! If people give them money they will go away, otherwise they will play a trick on you by drawing some-thing dreadful on your house or your car.

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The National Hockey League (Национальная хоккейная лига)

Ice hockey is one of the most popular kinds of sports, demanding skillful skating, expert stick-handling, and masterly puck control.

The game developed in the frozen expanses of North America, and a hundred years ago became the national winter sport of Canada. It also became very popular in the northern states of the United States, and later spread to Europe, Japan, and even to Australia.

Originally the leagues and national competitions in Canada were amateur. In 1917 the first professional league was formed, the National Hockey League (or NHL), with four clubs — Montreal Canadians, Montreal Wanderers, Ottawa Senators, and Toronto Arenas. Later clubs were formed in American cities, and the NHL spread to the United States.

In 1893 Lord Stanley, the Governor-General of Canada, presented a silver trophy, the Stanley Cup to the winners and play-offs for the Stanley Cup began, which then became the symbol of professional hockey supremacy.

Canadian-style ice hockey spread rapidly in Europe between the two World Wars.

Hockey is a team game played on an ice surface, known as a rink. Six players — a goalkeeper, two defence-men, and three forwards — constitute a side.

The game is divided into three periods, each lasting twenty minutes of actual playing time with -17-minute intervals. There are five face-off spots whereby the puck is dropped by the referee between the sticks of two players. After a goal is scored, the puck is brought back to center ice for another face-off.

The playing area (rink) is 188 to 200 feet long, and about 85 feet wide. The playing area is subdivided into three zones — defensive, neutral and attacking — by two blue lines (called off-side lines) teams defensive zone is that zone where the goal cage, which it is defending, is

located. The zone at the opposite end of the rink is known as the teams attacking zone.

The area between is known as the neutral zone and is divided at the centre by a red line. This line plays an important role in the game's body checking regulations.

The league draws many highly skilled players from all over the world and currently has players from approximately 20 different countries.

The most prestigious team award is the Stanley Cup, which is awarded to the league champion at the end of the Stanley Cup playoffs. The team that has the most points in the regular season is awarded the Presidents' Trophy. Since the formation of the league in 1917, they have 25 NHL championships. Despite only one trophy being used, the names of the teams winning and the players are engraved every year on the Stanley Cup.

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The Culture of England (Культура Англии)

The culture of England has a rich history and is a legacy of ancient European people like the Celts, Germans and Scandinavians. English being the language of international communication is considered to be one of the highest achievement of English culture.

One of the most typical features of English national character is conservatism and loyalty to traditions. One of the most famous English traditions is a commitment to the culture of drinking tea which the British borrowed from the Chinese.

The most unusual tradition is the unique way of washing-up (hot and cold water flows from different taps, are then is collected in a basin or sink for washing-up).

If we talk about costumes national English costume can nowadays be seen only during the celebration of May day. According to the tradition, theatrical performances of dance Morris ("dance with swords") are held these days.

Another English symbol – the garment of the Royal guardsmen, whose high bearskin cap gave them the nickname of "Bear skins". For over 300 years, these elite units in bright red dress uniforms have been guarding the residence of the British monarch. If we talk about sports culture, many of the famous sportsmen come from England. Although a national sport in England is considered to be cricket, in fact the title of the most widespread and popular sport belongs to football. Hundreds of thousands of fans cheer for such world famous football clubs like Manchester United, Liverpool, Chelsea and Arsenal.

The most important sport is equestrianism – horse racing and Polo. The town of Ascot in southern England is a center of equestrian sport in the country, because Royal horse racing «Royal Ascot» is annually held here, where the Queen is present.

In high school I loved to listen stories about England. And I've always wanted to go and see everything I heard about England. After all, England is a great country with a rich history and centuries of tradition.

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American Music (Американская музыка)

Considering the forbidding aspect of their new land, it is not surprising that the music of the early settlers was essentially a prayer set to song. The first music in the Colonies appeared in the 1698 edition of the Bay Psalm Book.

In the early 1700s the well-to-do tradesman imported music manuscripts from Europe to play at the concerts and balls. In the early 1800s more people had time and money for the cultural values, and the European music was widely heard, at the concert halls of all the cities.

By the mid- 1800s European romantic melodies were the favorite

music. Stephen Foster was the first great American songwriter who became famous in the 1850s for "My Old Kentucky Home" and other "plantation songs", as he called them. America, at last, found the voice of its own, and Foster's melodies were sung in the minstrel shows popular in those day.

With the wave of German immigration in the mid-19th century many trained musicians — performers, composers, and teachers popularized romanticism and its romantic instrument - the piano. The already growing piano business increased tremendously. One of the chief manufacturers was Henry Steinweg, a German immigrant, who changed his name to Steinway. By 1860 there were 22000 pianos in America.

The Civil War brought about martial music, and this music, in its turn, accelerated the development of the brass bands, which — with Sunday concerts in the park — became one of America's most popular musical institutions for the next half century. Enthusiasm for martial ensembles spread so rapidly that by the turn of the century more than 20000 amateur and professional brass bands were giving regular concerts in towns and villages throughout the country.

At the beginning of the 20th century American musicians were gaining a fast-growing audience. This appealing new sound was called jazz. Originating from the field hollers and work songs of the plantations, levees, turpentine camps, and prisons, early jazz and blues had haunting echoes of an American past. This music, in all its cultural and ethnic permutations, has perhaps done as much to gain understanding and respect among all races as any other single force in American history.

The popular song, that tuneful product of Tin Pan Alley, and country Western music are two other American creations that have struck responsive chords around the world. Until the early 1900s most classical music and most of the conductors and soloists came from Europe. Then a few American musicians, such as Charles Ives and Henry Cowell, started creating new sounds in their own way inspiring interest in contemporary music. Encouraged by outstanding schools of music, this interest has made the United States a leader in musical experimentation and innovation. Classical music composed in the US today is as American as folk music and jazz.

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Leonardo DiCaprio (Леонардо ДиКаприо)

He was born Leonardo Wilhelm DiCaprio on the 11th of November, 1974, in Hollywood, to Italian-American comic distributor George DiCaprio and his German-American wife Irmalin, a legal secretary who would go on to become Leonardo's manager. The boy's unusual name was chosen when he kicked his pregnant mother from the inside while she was viewing a Da Vinci in the picture gallery in Florence.

His first role was on the sitcom "Growing Pains", but his breakthrough film performance came in "This Boy's Life". This was quickly followed by "What's Eating Gilbert Grape"; his performance as the mentally handicapped brother of Gilbert (Johnny Depp) brought him nominations for the Golden Globe and Academy Award for Best Supporting Actor. DiCaprio has also been nominated for two BAFTAs, three SAGs, and seven Golden Globes. He is a Golden Globe and a Silver Bear winner.

DiCaprio was born in Los Angeles, California, the only child in the family. His parents divorced when he was 1 year old and he lived mostly with his mother, although his father was around intermittently. During his childhood, DiCaprio was interested in baseball cards, comic books, and frequently visited museums with his father.

DiCaprio's career began with his appearing in several commercials and educational films. His debut film role was "Critters 3", a Bgrade horror film, which later went straight to video.

His breakthrough came in 1992, when he beat out hundreds of other boys for the role of Toby Wolff in "This Boy's Life", co-starring Robert De Niro. The move from "star" to "superstar" came when DiCaprio played Jack Dawson in the 1997 blockbuster "Titanic".

In 2002, DiCaprio starred in Gangs of New York (directed by Martin Scorsese) and Catch Me If You Can (directed by Steven Spielberg). Both films were very well received by critics. DiCaprio continued his run with Scorsese in the 2006 film The Departed as Billy Costigan, a smart undercover cop in Boston.

DiCaprio's portrayal of Howard Hughes in The Aviator (2004), and Hugh Glass in The Revenant (2015), won him the Golden Globe Award for Best Actor – Motion Picture Drama, and his role as Jordan Belfort in "The Wolf of Wall Street" (2013), won him the award for Best Actor – Motion Picture Musical or Comedy. DiCaprio has been nominated for six Academy Awards—five for acting and one for producing—and in 2016, he won the Academy Award for Best Actor for "The Revenant'.

In addition to acting, DiCaprio is the founder of his own production company, named "Appian Way Productions". DiCaprio is a committed environmentalist.

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Шайхлиев Ильмир

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Solution for urban problems: a bicycle (Решение городских проблем: велосипед)

The level of pollution in megapolices is rapidly increasing so that many people find it impossible to breathe such air and settle in in suburbs. Pollution in big cities is a result of enormous number of cars and trolleys which pollute the air as well as big factories and plants. Moreover, numerous cars cause rush hours so that people can spend an hour without having moved at all.

People see the solution to both huge problems in one rather small and available thing in a bicycle. The bicycle is old enough, more than a hundred years of age. The bicycle has a very interesting history of invention which started long time ago. They say that Leonardo da Vinchy was the first to invent a bicycle. But one thing is to suppose, the other thing is to have some facts.

People have been using the bicycle for 200 years. A real history started with the invention of German Baron Karl von Drais. He presented his wooden "Draisienne" in about 1818. His vehicle was quite similar to the modern bicycle but it was a slight difference; namely, it didn't have any pedals. The first bicycle was run with the help of the legs. Only 20 years later the "Draisienne" vehicle was improved by Kirkpatrick MacMillan, a Scottish blacksmith, who added this missing element. First bicycles looked odd: a large (about 1.5m high) front wheel with a cranked axle. The back wheel was smaller. Bicycles were made of iron and riding them was not comfortable because of shaking. New types of bicycles appeared every year but only in 1885 people saw a model which looked like modern cycles. It had two almost equal wheels and a chain drive to the rear wheel. The frame of the cycle was diamond-shaped. This shape survived and became basic. The new machine looked more elegant than the old «spiders» which were soon abandoned. As time went by, new bicycles were invented — for two, three and even fifteen riders!

Bicycle has a lot of advantages which outweigh the disadvantages some people see in it. First of all, a bicycle does no harm to environment. If every second citizen used a bicycle, the air would be much cleaner. Secondly, the reduction of the number of cars, without any doubt, will improve the traffic situation of the city: people won`t have to spend hours in traffic jams. The third and the most important advantage is that bicycle is useful for our health. Sitting on one place can cause serious illnesses while a bicyclist doesn`t bother anything.

However, some people may find bicycles unstylish and may prefer a black Ford to a simple bicycle. But the choice is theirs: either fashion, or health and fresh air.

I believe that time will pass and people will finally distinguish between a comfortable car and a bicycle and their choice will be right. © Шайхлиев Ильмир, 2016

Шалашова Анна

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Superstitions in Britain and Russia (Суеверия в Великобритании и в России)

Many people are superstitious. They believe in unproven and mysterious facts. Moreover, they are afraid of them. For example, when a black cat crosses their path, they say it's for bad luck. Or, when they walk under the ladder, this also brings bad luck. In Britain people avoid having houses or flats number 13. They don't even have the 13th floor or room number in hotels. The unluckiest day is considered to be Friday the 13th, although some people simply have fun on this day, turning the superstition into an amusing game.

In England and Russia, a lot of superstitions are associated with mirrors. The most common superstition says that if you break a mirror, you will be accompanied by failures for seven years. Or the evil spirits that live in Wonderland, will chase you and take revenge for the fact that you "evicted them from their shelter."

But English and Russian superstitions also have many differences. Perhaps one of the most important differences is the interpretation of the signs when a black cat runs across your way. In Russia it means failure, while in England a black cat symbolizes just the opposite – happiness and good luck.

There is also a superstition in England that says: if your left hand itches - you will lose money. In Russia on the contrary, it is believed that your left hand itches promise you great wealth.

If Russian carrion crows are associated with something bad, in England they are considered to be the birds that bring good luck. It is not surprising that there are ravens that are kept in the famous Tower of London. And there is a belief that says that if the ravens ever fly away, the Tower will fall down!

There are millions of superstitions in the world. Each country has its own examples. For instance, Russians believe that carrying an empty bucket or bumping into a person with an empty bucket will do you no good. Taking out anything from home at night, especially the trash is also not good. Other forbidden acts are giving watches and knives as presents. Watches are believed to lead to breaking up, while knives lead to conflicts and quarrels. There are other, more pleasant, superstitions. During Christmas young girls get together and hold fortune-telling nights. They use some old-fashioned techniques to predict important things in their life, for example, the date of a wedding, the name of a future husband, etc. Other pleasant superstition is connected with spiders. You should not kill spiders in the house, because these insects are believed to bring good luck and money. Every country has its own omens and superstitions; sometimes they are similar to the superstitions of other countries. The only difference is that the relation to the subject of superstitions is different.

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Gravity Falls And Its Geography (Гревити Фолз)

Gravity Falls is an American animated television series created by Alex Hirsch and produced by Disney Television Animation for Disney Channel and Disney XD from June 15, 2012 to February 15, 2016.

The series follows the adventures of Dipper Pines and his twin sister Mabel in the town of Gravity Falls, Oregon. For their summer vacation, 12-year-old twins are dropped off from their home in Piedmont, California to the town of Gravity Falls, Roadkill County, Oregon to live with their Great Uncle Stan Pines, who runs a tourist trap called Mystery Shack. Things are not what they seem in this small town, and with the help of a mysterious journal that Dipper finds in the forest, they begin unraveling the local mysteries. Trapped together in the small isolated town, the siblings quickly realize they need each other to battle the imminent mysteries lurking in Gravity Falls. Meanwhile, when Grunkle Stan isn't busy trying to make a quick buck from his unsuspecting customers, he guards his own secret that might hold the key to unlocking the mysteries of Gravity Falls.

As the legend goes, Gravity Falls was founded in 1842 by the eight and a half president of the United States of America, Sir Lord Quentin Trembley III, Esq. He "discovered" it by falling off a cliff on a horse that he was riding backwards. However, this fact was covered up by the U.S. government, and instead "local nobody" Nathaniel Northwest was officially recorded as the town founder. The valley of Gravity Falls was actually formed by an alien spaceship crash-landing on Earth millions of years prior to the start of the series.

I have decided to look for Gravity Falls possible arrangement on the map and haven't found it, but according to the drawn map in the animated film, you can see that Gravity Falls can be located in the Oregon Vortex, located in Oregon. Residents of this city claim that they often witness paranormal activity at the place.

There also are many beautiful and unusual waterfalls there that attract people, one of the most unusual being Multnomah Falls which is located in Oregon, USA. The waterfall has a very specific feature: it is divided into two parts - the tiers, the upper tier is 620 feet high, and the lower one is only 69 feet high. Multnomah Falls is very similar to the waterfall from Gravity Falls.

As a child, Hirsch (the creator of GF) remembers taking road trips and being "enchanted" that there was a town called Boring. "Gravity Falls is partially from what I imagine Boring might be like. Or maybe the opposite of Boring, Oregon, would be Gravity Falls."

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Michael Jackson (Майкл Джексон)

Michael Joseph Jackson was a famous American singer, dancer, song writer, choreographer, philanthropist and an entrepreneur. He won 15 Grammy Awards and hundreds of other prizes during his life. Michael Jackson was born on the 29th of August, 1958, in the state of Indiana. He was the eighth of ten children of Joseph and Katherine Jackson. His father was a former boxer and a guitarist at the local R&B band. Michael was known to have many troubles with his father who regularly whipped him and verbally abused. As a child Michael was afraid to sleep alone in his own room as he had nightmares.

When he was only five, he was already a member of a family music band "Jackson Five". He soon got the place of a lead singer. But

working with his father was not easy. He had to go through numerous humiliations. Each time he did something wrong, his father would severely punish him. First time he spoke up about his childhood humiliations in 1993 during The Oprah Winfrey Show. When Michael was ten, "The Jackson Five" band signed a contract with Motown Records. It was the time when they recorded the following hits: "I want you back", "I'll be there", etc. In the mid-1970s the popularity of the band began to fall, while Michael's solo career began to prosper. In 1977, he made his debut in the musical "The Wiz". It was then that he started the long-term cooperation with a renowned producer and composer Quincy Jones.

In 1979, Michael released his solo album "Off the Wall", which topped all the UK and US charts. Moreover, the singer got his first Grammy Award for the song "Do not Stop 'Til You Get Enough". In 1982, he released the second album called "Thriller", which brought him seven Grammy Awards. Seventy million copies of this album were sold worldwide. In spring of 1983, at the show of "Motown 25" for the first time he introduced his famous "moonwalk", which became his signature dance walk. In 1987, the singer published his autobiography "Walking on the Moon". In 1991, Jackson signed the largest contract with Sony Records and released his solo album "Dangerous". He finally proved his status as the first star in the world of show business.

In 1993 the famous pop star was accused of sexual harassment by a thirteen-year-old boy. In December of the same year the singer was strip searched. One of his friends later said that Michael never recovered from this humiliation. He was always known for good attitude towards children, but this case caused irrecoverable damage to his reputation. One year later he married Elvis Presley's daughter. Some saw it as an attempt to save his reputation, others found the fact that two great musical families united to be rather moving. In 2003, the singer released the album of his greatest hits called "Number Ones". The great success was gained by "Thriller 25" released in 2008 to denote the 25th anniversary of the legendary album. The King of Pop accidentally died on June the 25th, 2009.

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Japanese Tea Ceremony (Японская чайная церемония)

The Japanese tea ceremony, also called the Way of Tea, is a Japanese cultural activity involving the ceremonial preparation and presentation of powdered green tea. This powdered green tea was first used in religious rituals in Buddhist monasteries.

There are two main ways of preparing tea for tea ceremony: thick and thin, with the best quality tea leaves used in preparing thick tea. Thin tea is served to each guest in an individual bowl, while one bowl of thick tea is shared among several guests. To prepare thin, powder green tea and hot water are whipped using the tea whisk, while thick is kneaded with the whisk to smoothly blend the large amount of powdered tea with the water.

The guests arrive a little before the appointed time and enter an interior waiting room, where they store unneeded items such as coats. The guests are served a cup of the hot water, kombu tea, roasted barley tea. When all the guests have arrived and finished their preparations, they proceed to the outdoor waiting bench in the garden, where they remain until summoned by the host. They remove their footwear and enter the tea room. When the last guest has taken their place, they close the door with an audible sound to alert the host, who enters the tea room and welcomes each guest, and then answers questions posed by the first guest about the utensil items. Following this, guests are served a meal in several courses accompanied by Japanese rice wine and followed by a small sweet. After the meal, there is a break during which the guests return to the waiting shelter until summoned again by the host, who uses the break to sweep the tea room and make preparations for serving the tea. Having been summoned back to the tea room by the sound of a bell, the guests again purify themselves. The host then enters, ritually cleanses each utensil in the presence of the guests in a precise order and using prescribed motions, and places them in an exact arrangement according to the particular procedure being performed. When the preparation of the utensils is complete, the host prepares thick tea. Bows are

exchanged between the host and the guest receiving the tea. The guest then bows to the second guest, and raises the bowl in a gesture of respect to the host. The guest takes a sip, and compliments the host on the tea. After taking a few sips, the guest wipes clean the rim of the bowl and passes it to the second guest. The procedure is repeated until all guests have taken tea from the same bowl. The host then rekindles the fire and adds more charcoal. This signifies a change from the more formal portion of the gathering to the more casual portion, and the host will return to the tea room to bring in a smoking set. The host will then proceed with the preparation of an individual bowl of thin tea to be served to each guest. Guests conduct easy conversation. The host then collects the utensils, and the guests leave the tea house. The host bows from the door, and the ceremony is over.

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English Cuisine (Блюда Английской Кухни)

English people have a special cuisine. Traditional English dishes include fish and chips, roast beef, steak, pudding and some others. For breakfast English people prefer either oatmeal or cereal with milk, fried eggs with bacon, a glass of orange juice or a cup of fresh coffee.

During lunch many people are away at work, or at school, so they carry their lunch with them. It usually consists of a couple of delicious sandwiches with ham, cheese and fresh vegetables, and a small pack of juice.

Many Englishmen drink 5 o'clock tea with cookies. It's a kind of English siesta. For dinner families usually gather around the diningtable to chat and to share some tasty dishes. Among them steaks or fish, steamed vegetables, rice, fresh salad, and a glass of wine or beer, depending on tastes. Children drink either water, or tea.

English families often go out for an evening meal, especially on Friday nights. Traditional English cuisine contains many interesting recipes, but probably the most famous of all is "Fish & Chips". This dish consists of fried chops from fish and French fries. On special occasions English people often serve roast turkey and traditional pudding. The English cuisine has a certain charm and value.

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British Traditions (Британские традиции)

British nation is considered to be the most conservative in Europe. It is not a secret that every nation and every country has its own customs and traditions. In Great Britain people attach greater importance to traditions and customs than in other European countries. Englishmen are proud of their traditions and carefully keep them up. The best examples are their queen, money system, their weights and measures.

There are many customs and some of them are very old. There is, for example, the Marble Championship, where the British Champion is crowned; he wins a silver cup known among folk dancers as Morris Dancing. Morris Dancing is an event where people, worn in beautiful clothes with ribbons and bells, dance with handkerchiefs or big sticks in their hands, while traditional music- sounds.

British people think that the Grand National horse race is the most exciting horse race in the world. It takes place near Liverpool every year. Sometimes it happens the same day as the Boat Race takes place, sometimes a week later. Amateur riders as well as professional jockeys can participate. It is a very famous event.

Another tradition is the holiday called Bonfire Night.

On November 5, 1605, a man called Guy Fawkes planned to blow up the Houses of Parliament where the king James 1st was to open Parliament on that day. But Guy Fawkes was unable to realize his plan and was caught and later, hanged. The British still remember that Guy Fawkes' Night. It is another name for this holiday. This day one can see children with figures, made of sacks and straw and dressed in old clothes. On November 5th, children put their figures on the bonfire, burn them, and light their fireworks.

In the end of the year, there is the most famous New Year celebration. In London, many people go to Trafalgar Square on New Year's Eve. There is singing and dancing at 12 o'clock on December 31st.

A popular Scottish event is the Edinburgh Festival of music and drama, which takes place every year. A truly Welsh event is the Eisteddfod, a national festival of traditional poetry and music, with a competition for the best new poem in Welsh.

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Phenomenon of fanfiction in English culture (Феномен фанфикшн в английской культуре)

Fanfiction or fanfic can be defined as a story that has been written by people who are fans of a particular book, film or computer game. Such story is inspired by an original work and expands, embellishes or modifies the actual text. The authors of these stories are usually called ficwriters. They use new characters, storylines and alternative endings to change the work of another usually published author.

It is believed that fan-written fiction has existed for several centuries.

Among the earliest examples might be Shakespeare's *Romeo and Juliet* published in 1597. W. Shakespeare borrowed the plot from *The Tragical History of Romeus and Juliet* by Arthur Brooke and expanded it by creating several supporting characters.

In 1850, William Makepeace Thackeray published *Rebecca and Rowena*, a satirical novel motivated by his discontent with the ending of Sir Walter Scott's Ivanhoe. Thackeray hated Ivanhoe's choice of bride and therefore he wrote his own ending to Scott's story, determined to set things right by getting Ivanhoe together with Rebecca, where he belonged.

In 1887, Sir Arthur Conan Doyle published *A Study in Scarlet*. Over the years the stories about Sherlock Holmes and Dr. Watson had become immensely popular. So when the author killed off Holmes in order to devote more time to his historical novels readers began to write their own stories. Some of these stories were as good as the original piece of work. This forced Sir Arthur Conan Doyle to raise the famous detective back from the dead and continue to write mysteries.

In 2003, the long-awaited 5th book *Harry Potter and the Order of the Phoenix* was released to the audience, fans were shocked and upset when the beloved character of Sirius Black was unexpectedly killed. So the Internet exploded with alternative endings in which Sirius never died.

Invention of the internet in 1990s had a huge impact on fanfiction. People with no literary background got the opportunity to write fanfics and publish them on-line.

Ficwriters created sort of internet archives in which fanfics were published and stored. Fanfiction.net is the most popular archive on the World Wide Web. It unites more than 2.2 million ficwriters, most of them are teenagers.

Nowadays fanfiction is both notorious and famous. It's triggered off by several subjects: books, especially sagas like Harry Potter and *The Chronicles of Narnia*, films and TV series such as *Dr. Who, Merlin* or *Downton Abbey*. In fact some fanfics are so engaging and impressive that producers and screenwriters use them to create new episodes.

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British English Vs American English (Британский и американский английский: основные различия)

There are some main differences between American and British English: differences in spelling words, in grammar and in vocabulary. **Differences in orthography** We can say that the Americans have a more economical orthography. Some unsounded letters are ignored and the words are written closer to the way they sound. The most obvious example – the lack of the letter U in some American words like «color», «neighbor», «honor». In American English there is a loss of the double consonants at the end of a word, while the British version of this consonant is doubled: traveler – traveler, traveling – travelling. These and other spellings are considered a norm in American English and an error in British English. However, some features of the spelling adopted in the USA are also accepted in British English. Permissible, for example, is to replace the suffix –ise with –ize in American English: advertize, realize.

Differences in grammar

The differences in grammar between American and British English are not as significant, and usually do not cause any difficulties. The differences are observed in the use of Present Perfect, in the coordination of collective nouns with verbs. In British English using the Present Perfect transmit the action that happened in the near past, but has a result in present. In American English, this action may be denoted by both the Present Perfect and the Past Perfect: I've lost my key. Can you help me look for it? (BrE) – I lost my key. Can you help me look for it? (AmE)

Collective nouns are words that denote a group of people. In American English collective nouns are used in singular form, while in the British variant plural form common: The team is playing well this season (AmE) – The team is playing well (BrE)

Differences in vocabulary

The percent of words that are only used in one country is very small and the problem for English learners is that these words are among the most frequently used. Many words are only used by the Americans, and most of them understand by the British, while others can cause problems. For example, the British know that the Americans call cookies biscuits, flat apartment, but not many people know that alumnus is graduate school. In turn, the Americans know that a yard in the UK is called a garden, a truck a lorry. Some words and phrases used in American and in British English, in spite of the absolutely identical spelling are different in meaning. For example, in American English the subway is called metro, but the British the word subway means underground passage. «Pants» in American English are trousers, but in the British variant they mean underwear.

The use of words

There also are countless interesting nuances related to the use of words. For Americans, the number having 9 zeros is a billion. For most British it is 12 zeros is a trillion. As for the zero, for American English, while in British English it is nought. The Americans are more likely to say the number 453 as the four hundred fifty three, and the British almost always say four hundred and fifty three.

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Science in the United Kingdom (Наука в Великобритании)

Science in the United Kingdom has a long an interesting history. At all times there were outstanding minds who invented incredible thing there. Among the outstanding scientists of the past we can name Isaac Newton, James Joule, Michael Faraday, John Maxwell, Charles Darwin, Ernest Rutherford, and the most prominent ones of the present are Stephen Hawking and Sir Andrew John Wiles.

British scientists received more Nobel Prizes than any other country's in the world except the United States, accounting for 4.5% of all research in the world. The Government is constantly investing in the development of science and technology. Only in the last year there were spent 14, 5 million pounds (almost 2% of GDP of Great Britain) from the budget, and in the next two years 1,400 million pounds will be added to this amount.

At the end of the XVIIth century the Royal Society developed a research program in the field of navigation, military technology, medicine, physics, metallurgy and nature.

In the late XIXth and early XXth century, English people made a great contribution to the development of scientific and technical progress. Unfortunately, the automotive industry of Britain was far

behind France and the United States. Only in 1895 the first English car, or, as they call it, a cart without a horse was built.

In the field of aircraft construction England also lagged behind, but it went ahead in the radio research. In England, the Italian Marconi first after Popov conducted successful experiments in radio transmission. In 1899, the signals sent from England were received in France, and at the end of 1901 with the station on the Cornwall peninsula they reached Newfoundland. Upon hearing this, the famous physicist Lodge said: "This is an era in the history of mankind!"

Modern scientists also made many scientific discoveries and assumptions about the world. One of the most famous and popular physicists of our time - Stephen Hawking revealed to the world a lot of amazing postulates. He explains complicated scientific facts and phenomena in a plain language, writes children's fiction co-authoring with his daughter.

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Japanese animation (Японская анимация)

Anime (Japanese: $\mathcal{P} = \mathcal{A}$) is Japanese hand-drawn or computer animation. The word is the abbreviated pronunciation of "animation" in Japanese, where this term references to all animation without regards to the nation of origin. Outside Japan, however, "anime" is used to refer specifically to animation from Japan.

Unlike other countries cartoons, designed primarily for viewing by children, most of produced anime is aimed at teenage and adult audience and due to this it has a high popularity in the world. Anime differs by the specific manner of drawing its characters and backgrounds. The story sources of anime series are manga (Japanese comics), ranobe (light novels), or computer games (usually in the "visual novel" genre). Less frequently other sources are used, for example, works of classical literature. There also are anime with completely original storylines. Japanese animation began in the early 20th century, when Japanese filmmakers started to experiment with the animation techniques also pioneered in France, Germany, the United States and Russia. First anime was very alike Western cartoons and the basis for their plots were classical pieces of literature. During the 1970s, anime developed further, separating itself from its Western roots, and developing distinct genres such as mecha. In the 1980s, anime was accepted into the mainstream in Japan, and experienced a boom in production. The film "Akira" set records in 1988 for the production costs of an anime film and went on to become a success worldwide. Since that anime has become more and more popular around the world. The peak of its success is considered to be the works of anime director Hayao Miyazaki. His "Spirited Away" shared the first prize at the 2002 Berlin Film Festival and won the 2003 Academy Award for Best Animated Feature.

Today, anime is a unique cultural layer that combines multiple genres and themes. It was officially recognized as the art and its popularity is growing rapidly all around the world.

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Секция 2

ИНОСТРАННЫЙ ЯЗЫК В СФЕРЕ ПРОФЕССИОНАЛЬНОЙ КОММУНИКАЦИИ

АГРАРНЫЕ НАУКИ

Аминева Азалия

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Projekt einer Imkerei (Проект пасеки)

Das Ziel des Projektes ist die Eröffnung des privaten Bienenstands.

Das Wesen des Geschäftes besteht im Verkauf des Honigs und der Produkte der Bienenzucht. Ich plane, ein Waldgrundstück von 0,5 Hektar in Pacht zu nehmen. Ich kaufe 50 Bienenvölker und Bienenkörbe, und ebenso das Inventar, die wirtschaftlichen Bauten für die Aufbewahrung der Bienen und Honigpumpen. Mit der Erwerbung der Erfahrung in der Arbeit mit den Bienen werde ich ihre Zahl erhöhen, ich werde Bienenvölker züchten.

Die beste Variante für die Unterbringung des Bienenstands ist unserer Meinung nach ein trockenes Grundstück, das von den Honigblumen etwa in zwei-drei Kilometern umgeben ist. Um die Honigsaison zu verlängern, muss man Pflanzen haben, die zu verschiedener Zeit blühen. Man muss den zukünftigen Bienenstand mit dem Zaun umzäunen, und wir unterbringen die Bienenkörbe in der großen Höhe und schützen vor dem Wind und der Sonne. Es ist wichtig, dass es in der Nähe keine Industriebetriebe und Farmerbetriebe gibt, da es auf die Gesundheit der Bienen negativ einwirken werden kann.

Es ist besser, die Imkerei auf dem Süd- oder Südostabhang mit bis zu 5° Neigung aufzustellen. Im Frühling taut hier der Schnee schneller und die Sonnenstrahlen begünstigen das Wachstum der Bienenvölker. Bei der kleinen Neigung wird der natürliche Abfluss der Niederschläge gewährleistet, und es entstehen die Vorbedingungen für die Anwendung "der Hilfsmechanisierung" bei der Pflege der Bienen.

Wir haben die Kosten berechnet. Sie betragen insgesamt 323 940 Rubel. Aus meinem Plan ist zu sehen, dass wir schon im ersten Jahr die Rückkosten bekommen werden. Und schon vom zweiten Jahr an bekommen wir das Gewinn.

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Roggenarten (Виды ржи)

Roggen ist eine in den gemäßigten Breiten verbreitete Getreideart aus der Familie der Süßgräser. Er liefert auch auf leichteren oder sandigen Böden und an kühleren oder feuchten Standorten noch gute Erträge. In Russland wird häufig Winterroggen angebaut, während Sommerroggen eine untergeordnete Bedeutung hat. Das Korn des Roggens wird für Nahrungs-, Futter- und Genussmittel oder auch als Nachwachsender Rohstoff genutzt. Teilweise wird auch die noch grüne Pflanze (Grünroggen) oder das bei der Getreideernte zurückbleibende Stroh genutzt. Hierbei wird der Roggen meist als Futtermittel in Form von Schrot oder Silage genutzt. Der Roggen besitzt 65 bis 200 Zentimeter lange Halme und 5 bis 20 Zentimeter lange, vierkantige, zur Blütezeit leicht überhängende Ähren aus einzelnen, meist zweiblütigen Ährchen mit schmalen Hüllspelzen und langbegrannten Deckspelzen. Die Tausendkornmasse (Masse von 1000 Körnern) beträgt bei Roggen 28 bis 50 Gramm.Der Roggen ist einjährig, meist winterhart, seltener sommerannuell und eine Langtagpflanze. Er ist ein Intensivwurzler, seine Wurzeln sind bis 1 Meter tief. Bei einer frei stehenden Pflanze können die Wurzeln eine Länge von 80 m und die Wurzelhaare eine Oberfläche von 400 Quadratmetern erreichen. Niedergedrückte Halme können sich durch einseitiges Wachstum eines Knotens schnell wieder aufrichten. Die Früchte sind Karyopsen, Samen und Fruchtschale sind miteinander verwachsen. Fruchtreife ist von Juli bis August. Die Zeit von der Samenkeimung bis zur Fruchtreife beträgt beim Winterroggen etwa 280 bis 320 Tage Von den Getreidearten wird der Roggen am meisten von dem stark giftigen Mutterkornpilz befallen. Nach der Infektion der Blüten entsteht an der Stelle der Früchte ein langes, braunes, hartes Korn, das auch arzneilich verwendet wird. Es gibt Sommer- und Winterroggen. Winterroggen ist die winterhärteste Getreideart, die Wintertemperaturen bis -25 °C übersteht, er kann die Winterfeuchtigkeit besser nutzen, übersteht eine Frühjahrstrockenheit leichter und ist deshalb im Kornertrag der Sommerform weit überlegen. Die Sommerform wird nur in Lagen mit Spätfrostgefahr und auf exponierten Berglagen angebaut. Roggen ist besser an kühle und trockene Klimate angepasst als der ertragsstarke Weizen, und ist deshalb das Getreide der Regionen mit verbreiteten Sandböden. Roggen ist ein Lichtkeimer und stellt deshalb besondere Anforderungen an Saat, Saatbett und Säzeitpunkt Roggen ist eine anspruchslose, abtragende, krankheitsresistente Frucht, die in alle Richtungen der Fruchtfolge variieren kann. Roggen hinterlässt einen garen, gut durchlüfteten Boden.

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Entwicklung des Mehrzweckmoduls für die Kartoffelernte in der persönlichen Hauswirtschaft (Разработка универсального модуля для уборки картофеля в личных подсобных хозяйствах)

Kartoffeln werden auf einer Fläche von 3,2 Millionen Hektar angebaut, und davon 92,2% in den persönlichen Hauswirtschaften. Eine wichtige Herausforderung für die Landwirte ist die Entwicklung der effektiven Produktion von Kartoffeln. Viele Landwirte verzichten auf industriellen Kartoffelanbau. Deshalb ist unser Ziel die Entwicklung eines der Mittel von Kleinmechanisierung für den Kartoffelanbau. Das konnte zum Anstieg der Kartoffel- und Gemüseproduktion in persönlichen Hauswirtschaften führen. Damit konnten die Landwirte die wirtschaftliche und soziale Rolle der individuellen Hauswirtschaft verstärken. Die Rolle der Kleinmechanisierungsmittel in der Entwicklung der persönlichen Hauswirtschaft ist sehr groß. Zurzeit wird ressourcenschonende Kartoffelanbautechnologie vorgeschlagen. Dabei hat die Technik einen Nachteil: es gibt keine Ausrüstung für Zerstäubung des organischen Düngers. Unser Ziel war Modernisierung dieser Technik. Wir haben ein vervollkommnetes Modul für den Kartoffelanbau auf kleinen Flächen ausgearbeitet (Bild 1, 2).



Abbildung 1. 3-D Modell des Moduls



Abbildung 2. Betriebsschema des Moduls

Im Vergleich zu den Ausrüstungen der Konkurrenzfirmen ist unser Modul viel billiger und einfacher im Betrieb: Selbstkosten beträgt etwa 6-8 Tausend Rubel, Verkaufspreis kann 11 bis 13 Tausend Rubel sein. Damit kann unser Modul die Kartoffelproduktion in unserer Region viel billiger und leichter machen. Dadurch kann sich wiederum die Rolle der individuellen Hauswirtschaft verstärken.

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Feldschützende Waldstreifen im Rayon Siantschurinski (Полезащитные лесные полосы на территории Зианчуринского района)

Der feldschützende Waldstreifen wird genutzt, um das Mikroklima und Bodenbedingungen für Getreideanbau zu verbessern und um den Boden vor Wind- und Wassererosion zu schützen. Die feldschützenden Waldstreifen reduzieren die Geschwindigkeit des Windes, schützen landwirtschaftliche Kulturen vor Dürre, vor heißen Winden und erhöhen ihre Ertragsleistung. Dazu verwendet man eine bestimmte Auswahl von Baum- und Straucharten sowie ihre Mischung in Übereinstimmung mit der Boden- und Klimabedingungen und biologischen Eigenschaften der Geholzarten. Die wichtigsten Geholzarten, die die Grundlage im Bestand bilden und die schützenden Eigenschaften der Schutzstreifen bestimmen, sind die Stieleiche, die Walnuß und die Schwarznuß, die Robinie, verschiedene Pappelnarten.

Pappeln haben eine verstärkte Transpiration durch die Krone, sie entwässern Moorgebiete, schützen die zu bewässernden Felder vor Sumpfbildung, befestigen Flußufer. Viele Arten und Sorten von Pappeln verwendet man jetzt erfolgreich als Hauptart im Schutzstreifen in Steppen- und Waldsteppengebieten. Im Rayon Siantschurinski werden als Schutzstreifen solche Baumarten verwendet wie: die Balsampappel, die Silberpappel, die Schwarzpappel, Hybridpappeln. Die *Balsampappel* ist die am schnellsten wachsende Baumart. Sie wächst bis zu 35 m hoch. Die Balsampappel blüht vor dem Laubausbruch im April - Mai. Sie ist ziemlich gas- und frostunempfindlich. Sie ist lichtbedürftig, kann aber den Halbschatten vertragen. Gut verträgt sie trockene Luft und Bodenversalzung. Sie lebt bis 150-200 Jahre.

Die *Weiß- oder Silberpappel* besiedelt die Auwälder. Sie hat ein tiefes Wurzelsystem. Sie kann die Trockenheit vertragen, aber schnell wächst sie nur in fruchtbaren und ausreichend feuchten Böden.

Die *Schwarzpappel* ist die am schnellsten wachsende Baumart in den gemäßigten Regionen. Sie wird weit bei der Schaffung von Schutzpflanzungen um Industriegebiete verwendet, die Verkehrs- und Eisenbahnen entlang, die Ufer von Flüssen und Kanälen entlang.

Die Hybridart "*Die baschkirische pyramidale Pappel*" wurde in den späten 30er Jahren des vergangenen Jahrhunderts von Spezialisten der baschkirischen Waldversuchsstation gezüchtet. Das ist ein schlanker Baum bis zu 30 m hoch mit einer sehr schmalen säulenartigen Krone. Sie ist eine Lichtbaumart. Diese Art ist gut für schnellwachsende grüne Schutzwände geeignet.

Es ist unserer Meinung nach zu empfehlen, die obengenannten Pappelnarten für Waldschutzstreifen zu verwenden.

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Нагаева Айгуль

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What is Geodesy? (Что такое Геодезия?)

The classical definition of geodesy is that it is the science concerned with the shape, size, and the gravity field of the Earth. However, geodesy today is much more than that. The task of the paper is to demonstrate the variety of aspects geodesy covers. First of all, the science monitors both solid and liquid Earth. The solid Earth implies displacement, subsidence or deformation of the ground and structures due to tectonic, volcanic and other natural phenomena as well as human activity. As for the liquid Earth, such variations as sea-level rise, ice sheets, mesoscale surface topography features, mass transport are considered. Variations in the Earth's rotation including polar motion, the length of the day are in the focus area of the science. In addition, geodesy monitors temporal variations in the Earth's gravity field. Attention is paid to the atmosphere: satellite geodetic techniques are employed to monitor ionosphere and troposphere composition and physical state of atmosphere. Geodesy is much concerned with determining satellite orbits (including Earth observation and navigation satellites) and positions of points on or above the surface of the Earth with the utmost accuracy.

It is noteworthy that geodesy serves society by providing reference frames for a wide range of practical applications, such as navigation on land, sea and in the air, the building of infrastructure and the determination of reliable boundaries for real estate properties or even maritime zones. In the past, such reference frames were created on a national or regional level. Today, through the exploitation of the existing and planned Global Navigation Satellite Systems (GNSS) such as GPS, Glonass, Galileo and Compass/BeiDou, geodesy provides access to point coordinates in a global reference frame anytime and anywhere on the Earth's surface with centimetre -level accuracy.

Due to today's significantly improved geodetic instrumentation and techniques, geodesy has become more concerned with changes in the 'geometry' and 'gravimetry' of features on, beneath or above the surface of the solid Earth and oceans than it was previously. Today geodesy serves all geosciences, including the geophysical, oceanographic, atmospheric, hydrological and environmental science communities whereas in the past, the main 'customers' of geodesy came from the surveying and mapping.

Thus, geodetic 'products' help people understand the Earth. Also, they are useful in disaster prevention, protection of the biosphere and the environment. Increased security, a better use of natural resources and sustainable development on our planet are the long-term goals of the science.

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Landwirt und Tiere (Фермер и животные)

Tiere sind Lebewesen, die organische Stoffe als Nahrung aufnehmen. Die Tierwelt ist somit von der Existenz einer Pflanzenwelt abhängig. Im Unterschied zu den Pflanzen fehlt den Tieren das Blattgrün, die Zellen sind nicht von einer Zellwand aus Zellulose umschlossen. Die Nahrung wird in besondere Hohlräume des Körpers aufgenommen und mit Hilfe von Fermenten zersetzt. Die nunmehr gelösten Stoffe werden resorbiert und in körpereigene Substanz umgewandelt oder im Energiestoffwechsel verbraucht. Zur Entfernung von Stoffwechselschlacken sind besondere Ausscheidungsorgane ausgebildet. Alle größeren Tiere besitzen Atmungsorgane. Das Tier steht neben der Pflanze im Mittelpunkt der landwirtschaftlichen Praxis. Es interessiert den Landwirt in zweierlei Hinsicht, einmal als Nutztier und zum anderen als Schädling. Als Nutztier liefert es Nahrung und Rohstoffe, außerdem leistet es Arbeit. Landwirtschaft und Zoologie sind aufs engste verknüpft. Der Landwirt wird häufig vor Probleme gestellt, zu deren Lösung er die Ergebnisse der zoologischen Forschung benötigt. Die Wissenschaft, die sich mit den Tieren beschäftigt, ist die Zoologie. Sie ist ein Teilgebiet der Biologie, der Lehre vom Leben. Weitere Teilgebiete der Biologie sind die Botanik, die Wissenschaft von den Pflanzen, und die Anthropologie, die Wissenschaft vom Menschen. Nach den verschiedenen Forschungsrichtungen unterscheidet man innerhalb der Zoologie folgende Arbeitsgebiete:

1. Die Systematik hat die Aufgabe, die Tiere zu beschreiben und sie nach Übereinstimmungen und Abweichungen in Bau und Lebensweise zu ordnen.

2. Die Morphologie ist die Lehre vom Bau des tierischen Körpers. Sie gliedert sich in folgende Untergebiete:

a) die Morphologie im engeren Sinne; sie ist die Lehre vom äußeren Bau des Tierkörpers,

b) die Anatomie ist die Lehre vom inneren Grobbau des Tierköpers,

c) die Histologie (Gewebekunde) und die d) Zytologie (Zellkunde); beide untersuchen den inneren Feinbau des Tierköpers.

3. Die Physiologie untersucht die Lebenserscheinungen des Tierkörpers und seiner Organe.

4. Die Biogenie (Entwicklungslehre) unterteilt man in die Untergebiete Ontogenie (Einzelentwicklung) und Phylogenie (Stammesentwicklung). Die Ontogenie behandelt die Entwicklung der einzelnen Tiere von der befruchteten Eizelle bis zu ihrem erwachsenen Zustand. Die Phylogenie beschreibt die Entwicklung der Rassen, Arten und höheren systematischen Kategorien im Laufe aufeinanderfolgenden Generationen.

5. Die Ökologie ist die Lehre von den wechselseitigen Beziehungen der Tiere zu ihrer Umwelt.

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Down's syndrome (Синдром Дауна)

The first chromosomal disease discovered by catalogue was Down syndrome. Back in 1866 the English doctor Langdon Down described this peculiar form of mental retardation. Since then a variety of explanations of the disease syndrome were put forward. The idea that Down syndrome is a chromosomal disorder was expressed in the 30s of XX century. However, only in 1959 the French scientists Lejeune, Gautier and Turpin found extra chromosome which was chromosome No. 21 to the Denver classification in the cells of patients with Down's syndrome.

Patients with Down's syndrome occur with a frequency of 1 in 900 newborns. Experienced obstetricians recognize this condition immediately after birth. The appearance of Down's syndrome, especially
in the first years of life, is very characteristic: short stature, small round head, flat back of the head, peculiar face (slanting eyes, short, flatbridge nose, deformed ears, thick and clumsy language). The body proportions are wrong. From an early age spike lag of neuropsychic development becomes noticeable. There are a lot of features specific to the stage of embryonic development, indicating delayed development of the embryo with the Down syndrome at a fairly early stages.

The mechanism of occurrence of trisomy on the 21st chromosome, like other trisomy, generally is known to scientists. The extra chromosome appears in reproductive cells of a parent as a result of nondisjunction of homologous 21th chromosomes in the fission process. As a result, the fertilized egg contains not 46, but 47 chromosomes. Of course, in this case all embryo cells will be trisomic, which slows down the development of an organism.

Because nondisjunction of chromosomes in meiosis is an accidental phenomenon, Down syndrome in such classic cases (95%) is not inherited and the chance of having a second child with trisomy for 21st chromosome is very small. However, in a small number of cases Down syndrome occurs as a result of the transfer of the 21st chromosome in the genome of one of the parents to some other, often 15th. The owners of the chromosome are clinically healthy, but their children with a high probability will have this complex of two chromosomes in genome, i.e. actually 47 chromosomes and the clinical manifestations of Down syndrome.

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Swamp in the the USA (Болота в США)

A swamp is any wetland dominated by woody plants. Swamps are characterized by saturated soils during the growing season, and standing water during certain times of the year. The highly organic soils of swamps form a thick, black, nutrient-rich environment for the growth of water-tolerant trees. Some swamps are dominated by shrubs. Plants, birds, fish, and invertebrates such as freshwater shrimp, crayfish, and clams require the habitats provided by swamps. Many rare species, such as the endangered American crocodile depend on these ecosystems as well. Swamps may be divided into two major classes, depending on the type of vegetation present: shrub swamps, and forested swamps.

Swamps serve vital roles in flood protection and nutrient removal. Floodplain forests are especially high in productivity and species diversity because of the rich deposits of alluvial soil from floods. Many upland creatures depend on the abundance of food found in the lowland swamps, and valuable timber can be sustainably harvested to provide building materials for people.

Due to the nutrient-rich soils present in swamps, many of these fertile woodlands have been drained and cleared for agriculture and other development. Over 70 percent of the United States' floodplain forested swamps have been lost. Many of the remaining mangrove swamps in Florida are threatened by residential development

Forested swamps are found throughout the United States. They are often inundated with floodwater from nearby rivers and streams. Sometimes, they are covered by many feet of very slowly moving or standing water. In very dry years they may represent the only shallow water for miles and their presence is critical to the survival of wetlanddependent species like wood ducks, river otters, and cottonmouth snakes. Some of the common species of trees found in these wetlands are red maple and pin oak in the Northern United States, overcup oak and cypress in the South, and willows and western hemlock in the Northwest.

Shrub swamps are similar to forested swamps, except that shrubby vegetation such as buttonbush, willow, dogwood, and swamp rose predominates. In fact, forested and shrub swamps are often found adjacent to one another. Mangrove swamps are a type of shrub swamp dominated by mangroves In the United States, mangrove swamps are found only along the coast of the Gulf of Mexico, with the vast majority occurring in Florida. Small areas of mangrove swamp are found in Texas and Louisiana. Mangrove swamps are critically important as nurseries for many species of fish and shellfish, including many recreationally and commercially important species. Mangrove swamps also help reduce shoreline erosion and can shield inland areas from some of the damaging effects of hurricanes.

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Sherlock Holmes and His Diagnosis: Asperger syndrome (Шерлок Холмс и его диагноз: синдром Аспергера)

Sherlock Holmes is actually listed in "Guinness World Records" as "the most portrayed movie character" ever, with 75 actors playing the part in more than 211 films. But he shows up on the autism spectrum. Holmes' hyper-keen observational skills, social mannerisms and overall personality testify to this.

Asperger syndrome or Asperger's syndrome is an autism spectrum disorder that is characterized by significant difficulties in social interaction, along with restricted and repetitive patterns of behavior and interests. It differs from other autism spectrum disorders by its relative preservation of linguistic and cognitive development. Although not required for diagnosis, physical clumsiness and atypical use of language are frequently reported.

Asperger syndrome is named after the Austrian pediatrician Hans Asperger who, in 1944, studied and described children in his practice who lacked nonverbal communication skills, demonstrated limited empathy with their peers, and were physically clumsy. Fifty years later, it was standardized as a diagnosis.

Speaking of Sherlock Holmes, the first thing to keep in mind is that the character isn't just portrayed as being really smart - he is obsessed with certain subjects and totally excludes all others. These uneven obsessions with random topics- in Holmes' case, things like tobacco ashes and regional soil consistency - are not signs of an enthusiast; they are symptoms of a disorder. Or, as the Yale Child Study Center puts it, Asperger's sufferers show "...a narrow range of capacities for memorizing lists or trivial information, calendar calculation, visual-spatial skills such as drawing, or musical skills involving a perfect pitch or playing a piece of music after hearing it only once."

And most telling is that Holmes' talents are coupled with an inability to interact socially with anyone but Watson. He embarks on longwinded monologues about very specific topics, oblivious to the listener's lack of interest.

It is necessary to add that the disorder wouldn't be recognized until 70 years after Doyle invented the character.

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Die Zukunft der Müllbeseitigung (Будущее устранения мусора)

Eines der ernstesten Probleme des Schutzes der Umwelt sind die Plastikverpackungen und die Umschläge, die in der Natur sehr eine lange Zeit zerlegt werden und sind ein Grund der Massenverschmutzung. Forscher an der Stanford University in der Zusammenarbeit mit den Kollegen aus China haben die Würmer gefunden, die eine Lösung des Problems werden können. Die Mehlwürmer (die Larve des Mehlkäfers), die als Futter für die Vögel, die kleinen Tiere, die Amphibien, die Reptilien und die Aquarienfische aktiv verwendet werden. Ihre Ration besteht im natürlichen Kulturmedium aus den Früchten und dem Gemüse, aber, wie es sich zeigte, sie sind fähig, verschiedene Arten der Kunststoffe, unter anderem Polystyrol zu verarbeiten, aus dem verschiedene Verpackungen hergestellt werden. Die Mehlwürmer verarbeiten Polystyrol in die biozerlegten Abfälle günstig. Die Forscher gaben den Tieren Polystyrol zu fressen, einen Kunststoffschaum, der hier zu Lande besser unter dem Namen Styropor bekannt ist. Anschließend untersuchten sie die Verdauung und den Gesundheitszustand der 100 Testesser. Diese konsumierten durchschnittlich 34 bis 39 Milligramm Kunststoff pro Tag und schieden es in Form von CO2 und Kot wieder aus. Die Ausscheidungen der Käferlarven lassen sich als fruchtbarer Boden etwa für Getreidepflanzen verwenden.

Zuerst wollen die Wissenschaftler die Mehlwürmer nun weiter untersuchen und die einzelnen Prozesse verstehen. Dann wollen sie sich auf die Suche nach anderen plastikfressenden Insektenarten machen, womöglich auch im maritimen Bereich. Weitere vielversprechende Entdeckungen kämen äußerst passend, nimmt die globale Verschmutzung der Ozeane durch Plastikmüll und die auf Müllkippen gesammelte Menge doch immer weiter zu.

Mehlwürmer – die wurmartigen Larven des Mehlkäfers – haben bereits einen Ruf als wenig anspruchsvolle Überlebenskünstler. Dass sie aber auch mit Polystyrol als Nahrung auskommen und dadurch womöglich gar bei der Beseitigung unserer drängenden Müllprobleme helfen könnten, zeigt sich erst jetzt. Anschließend untersuchten die Forscher die Verdauung und den Gesundheitszustand der 100 Testesser. Diese konsumierten im Schnitt 34 bis 39 Milligramm Kunststoff pro Tag und schieden es in Form von CO_2 und Kot wieder aus. Die Ausscheidungen enthielten nach Angaben der Forscher nur biologisch abbaubare Substanzen und könnten daher theoretisch als Nährsubstrat in der Pflanzenzucht eingesetzt werden.

Die meisten industriell genutzten Kunststoffe lassen sich nur schwer durch biologische Prozesse zerlegen, mit dem Effekt, dass sie sich in der Umwelt anreichern und dort zum Teil den Einfluss auf die Tierwelt nehmen. Gesucht sind daher Prozesse, die ihren Abbau in umweltverträglicher und energiesparender Weise ermöglichen – vielleicht könnten hier in Zukunft Mehlwürmer helfen.

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Healthy food (Здоровая пища)

All food is made up of nutrients which our bodies use. There are different kinds of nutrients: carbohydrates, proteins, fats vitamins and minerals. Different foods contain different nutrients.

Before we cut down on fat, sugar and salt, we have to know a bit more about the kind of food these things might be in. The biggest problem comes when these things are hidden in other foods: biscuits, crisps, sausages, meat pies, soft drinks and so on.

The best way is to get into the habit of checking the ingredients and nutritional value on the sides of packets although this isn't always easy to do. Another thing to know is, for example, that we do need fat to live, it's an essential part of our diet and physically we couldn't exist without it.

But we all know that to eat much fat is bad for our health. The matter is that there are different kinds of fat. There are fats that are good for us and fats that are bad for us. Eating less of the bad ones and more of the good ones can actually help us to live longer! Bad fats are the saturated fats, found in animal productions, like red meat, butter and cheese.

Friendly fats are the unprocessed fats found naturally in foods like nuts and seeds, olives, avocados and oily fish, including tuna.

One more thing to know is that when food is cooked, its structure changes. It can change the vitamin and nutrient contents of food.

More and more people feel strongly about the way their food is produced. Nowadays so much of the basic food we eat — meat, fish, fruit and vegetables — is grown using chemicals and additives.

Although fertilizers and pesticides have greatly increased the quantity of food and helped to improve its appearance, there is a growing concern about the effects of these chemicals in the food chain. This concern has led to a growth in the demand for organically grown products.

Today there is another problem. It is modified food, which is cheaper that ordinary one. There is a rumour that such food can cause cancer and other problems. Nobody knows, either it is just an imagined fear or a real problem. This problem could be solved and examined, but it will take some time.

The food we eat depends on lots of things. Taste is a big factor. Culture, religion and health also play a part in what food we eat. Advertising and social factors also have a big influence.

Income is also an important factor. That is why not surprisingly, money, rather than a lack of knowledge about how to eat well, is at the heart of the problem.

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Key For Healthy Living (Ключ к здоровой жизни)

Today the number of diseases are on the rise and this has necessitated the need for healthful living. Living a wholesome life may help stop some disorders like diseases of a cardiovascular system, cancer, diabetes, and hypertension. Healthy residing should be the inclusion of each mental and physical health. There is a selection of matter that will be accomplished to achieve a healthful dwelling.

Ingesting a balanced diet is one way to attain a wholesome living. It is vital to note that diverse age teams have distinctive diet requirement. For instance the diet for infants might be distinctive from that of youngsters and grownups. Every age group must be provided using the proper diet program to ensure correct growth and health. It is additionally essential that good portions of foods be eaten to avoid ingesting excessively. Excessive consuming can lead to bodyweight obtain that may trigger overall health troubles.

Regular training encourages the wellness of somebody drastically. Exercises boost metabolic rate, burning of surplus energy while in the human body in addition to promote more robust bones. Physical exercises minimize threat of getting heart assault since their aim is to cut down the level of cholesterol. By exercise routines, the muscle groups of your coronary heart are strengthened; this improves the operation of the heart and great blood circulation.

Last but not the very least, a person must regularly have a rest. Devoid of good enough relaxation a person might be in danger to obtain health challenges. A relaxation of seven to eight hours on a daily basis is required for the very good balance. This allows the body to restore energy for use over the upcoming day. Adequate relaxation also boosts the immune system in the system for this reason can battle diseases effortlessly. It promotes one's concentration, considering and memorizing things.

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The genus Ceratogyrus (род Цератогирус)

Representatives of the genus Ceratogyrus are especially worth noticing among the African tarantulas. They have a fairly unusual for spiders feature - a so-called "horn". Because of this characteristic this genus got its name, Ceratogyrus, also these spiders are commonly called "horned baboons". However not all members of this genus possess a horn, but only the following species: C. brachycephalus, C. darlingi, C. dolichocephalus, C. marshalli, C. sanderi.

This "horn" is more like a projection. It is placed on the back shield of the carapace. The upper layer of this projection consists of chitin as is the rest of the exoskeleton. During molting spiders shed the whole exoskeleton, including the chitinous cover of the horn. The internal anatomy of the horn is more complicated. The functions of the horn are not completely clear, it may fulfill some functions at a time. Area of the genus covers the southern part of Africa. As a rule the spiders are to be found in open forests and savannas, where shrub vegetation and herbaceous plants prevail and the climate is dry and hot. That's why spiders prefer digging deep burrows and leaving them only in the night to hunt other arthropods.

Appearance. Most of the representatives of the genus are colored gray or golden with spots and markings, which help spiders to disguise themselves. Another characteristic feature is the coloration of the abdomen presenting itself in dark and light contrast stripes, which allow to determine the species of a spider. The size is not very big. The biggest species of the genus - C. marshalli, adult females can grow up to 13 cm leg span and 6 cm body length, other species are smaller. Males are smaller than females.

The temper of these spiders is very aggressive. In case of danger the spider swiftly raises its front legs and takes a threatening posture, while contrast coloring of abdomen warns against approaching towards the spider. Since the spider belongs to the terrestrial species, it usually leans with abdomen on the burrow's ground and spreads its legs, which visually makes the spider bigger but also prevents entering the burrow. Then the spider produces a quiet loud hissing. If aggressor is not frightened by that, the spider will thrust rapidly toward the disturber and try to bite. Even if the aggressor starts to retreat, the spider may continue attacking. The poison of this species is fairly strong and can kill a small animal. It's not lethal for a human although can cause some unpleasant consequences. Ceratogyrus can run pretty fast.

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Astigmatism (Астигматизм)

Astigmatism is one of the most common causes of low vision. This is a violation of the optical structure of the eye, where the image of the subject is not focused properly on the retina. In the normal state, the cornea and the crystalline lens healthy eyes have a smooth spherical surface. With astigmatism, they have different curvatures in different directions. Some parts of the image can be focused on the retina, the other - "for" or "before" it.

By nature of occurrence of astigmatism divided into congenital (up to 0.5 D) and acquired (greater than 1 D or more). There are corneal and lenticular astigmatism, and total astigmatism of the system eye (cornea + lens). There are three degrees of the disease. A low degree of astigmatism - up to 3 D. This degree lends itself well to the correction of any existing methods. It is best to deal with it laser vision correction. Astigmatism an average degree - from 3 to 6 D - is not corrected glasses. It can correct the laser correction, contact lenses or a surgical operation. A high degree of astigmatism - above 6 D - is the result of gross changes in the cornea. Fix it can be hard contact lenses or a combination of surgical and laser vision correction.

Often the astigmatism is combined with myopia (myopic astigmatism) or hyperopia (hyperopic astigmatism).

What are the dangers astigmatism. If astigmatism is not treated, it can lead to a squint and a sharp drop in sight. Without correction astigmatism can cause headaches and pain in the eyes.

Spectacled correction of astigmatism. When astigmatism often appoint special "complex" glasses with special cylindrical lenses. In recent years, for the treatment of astigmatism (up to \pm 3,0 D) is most commonly used excimer-laser correction. This procedure is carried out for 10-15 minutes under local drop anesthesia. Good see the patient begins within 1-2 hours after the procedure, and the final vision is restored within a week.

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Biotechnologie: Algen als die Quelle der sauberen Energie (Биотехнология: водоросли как источник чистой энергии)

Biomasse ist eine erneuerbare Energiequelle, die sowohl zur Wärme-, als auch zur Stromgewinnung eingesetzt werden kann. Biomasse kann potenziell eine Schlüsselrolle bei der Verringerung von CO_2 Emissionen aus bestehenden Kohlekraftwerken spielen.

Im Fokus stehen dabei zwei globale Probleme: Die Begrenzung des CO_2 Eintrags in die Atmosphäre und die nachhaltige Deckung des wachsenden Rohstoffbedarfs.

Die Antworten auf diese Probleme kann die Produktion Mikroalgen und Algenöl darstellen. Einzellige Grünalgen und auch Cyanobakterien verheißen nachwachsende, saubere Energie. Ganz neu ist der Gedanke freilich nicht – mit Raps, Soja und Mais wollte man so schon einmal die Energiewende einläuten. Doch der Anbau dieser Pflanzen zur Kraftstoffgewinnung ist weltweit umstritten: Denn Äcker, die Treibstoff produzieren, produzieren keine Nahrung. Mikroalgen wären ein Ausweg aus diesem Teller-Tank-Dilemma. Sie benötigen im Gegensatz zu Landpflanzen kein wertvolles Ackerland, um zu wachsen, vermehren sich sehr viel schneller und produzieren entsprechend deutlich mehr Biomasse pro Fläche: Bis zu 100 Tonnen Trockenmasse pro Hektar und Jahr verglichen mit 17 Tonnen bei Zuckerrohr oder 3,5 Tonnen bei Weizen. Auch an Wasser haben sie keine hohen Ansprüche und geben sich mit Salz-, Brack- oder Abwasser zufrieden.

Grundsätzlich wird dabei zwischen zwei möglichen Techniken zur Energieerzeugung unterschieden. Zum einen die Vergasung der Algenbiomasse als Co-Substrat in einer Biogasanlage zum Zwecke der anschließenden Stromgewinnung und zum anderen die mögliche Option, die in den Mikroalgen enthaltenen Lipidtropfen zu extrahieren und nach einer Veresterung entsprechend herkömmlichen Pflanzenölen als Biodiesel zu nutzen.

Daneben wird bei der Zucht von Mikroalgen und der Produktion von Algenbiomasse klimaschädliches Kohlenstoffdioxid gebunden und so der Atmosphäre entzogen. Dies geschieht mit einem Verfahren, das auf einem der ältesten und wichtigsten Mechanismen der Erde beruht – der Photosynthese. Wie alle grünen Pflanzen, betreiben auch Mikroalgen diese Form der Umwandlung von Sonnenlicht und Kohlenstoffdioxid zu Biomasse und Sauerstoff und produzieren so nicht nur die lebensnotwendige Grundlage zum Atmen, sondern erhalten gleichzeitig auch das Gleichgewicht zwischen den Treibhausgasen der Atmosphäre.

Jedoch hat diese Technologie, wie auch die übrigen Technologien des Erhaltens der Energie, einige Mängel. Und viele Wissenschaftler arbeiten an dieser Technologie und Eigenschaften von Algen effektiv und erfolgreich.

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Nature Protection (Охрана природы)

We have upset nature's sensitive equilibrium releasing harmful substances into the air, polluting rivers and oceans with industrial waste and tearing up the countryside to accommodate our rubbish. These are the consequences of the development of civilization. We are to stop it by joint efforts of all the people of the world. The range of environmental problems is wide. But the matters of people's great concern nowadays are atmosphere and climate changes, depletion of the ozone layer, freshwater resources, oceans and coastal areas, deforestation and desertification, biological diversity, biotechnology, health and chemical safety. United Nations Environment Programme concentrates its activities on these issues.

One of the most alarming forms of air pollution is acid rain. It results from the release into the atmosphere of sulphur and nitrogen oxides that react with water droplets and return to earth in the form of acid rain, mist or snow. Acid rain is killing forests. It has acidified lakes and streams and they can't support fish, wildlife, plants.

The ozone layer, which protects the Earth from the sun's destructive ultraviolet rays, is being damaged by chlorofluorocarbons. They are released by the daily use of industrial and household products: refrigerators, air conditioners, cleaning chemicals, food packaging. In the ozone layer they attack the ozone molecules making a «hole». This «hole» allows more ultraviolet rays to penetrate to the Earth. It increases the risk of skin cancer, weakens the immune system of people. Besides, ultraviolet rays influence the oceans, the growth of plankton, an essential part of the marine-life food chain in the negative way; reduce economically important-crops. The life cycle is going to be undermined by the ozone.

It's generally agreed that the destruction of the tropical forest has a major impact on the world climate. The tropical rain forest is a natural recycler, provider and protector for our planet. It recycles carbon, nitrogen and oxygen, helps determine temperature, rainfall and other climatic conditions and supports the most diverse ecosystem in the world.

We have only a few years to attempt to turn things around. We must review our wasteful, careless ways, we must consume less, recycle more, conserve wildlife and nature, act according to the dictum «think globally, act locally». To my mind, we are obliged to remove factories and plants from cities, use modern technologies, redesign and modify purifying systems for cleaning and trapping harmful substances, protect and increase the greenery and broaden ecological education. These are the main practical measures, which must be taken in order to improve the ecological situation.

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Drugs (Наркотики)

More people are abusing drugs today than in any other time in history of mankind, and many of those people are youth.

Understanding what drugs are is fundamental for understanding their potential abuse. Drugs are a psychoactive substance.

A psychoactive substance is something that people take to change the way they feel, think or behave. Some of these substances are called drugs and others, like alcohol and tobacco, are considered dangerous, but are not called drugs. The term drug also covers a number of substances that must be used under medical supervision to treat illnesses.

I am going to talk about drugs as those man-made or naturally occurring substances used without medical supervision, basically to change the way a person feels, thinks or behaves.

In the past, most drugs were made from plants. That is, plants were grown and then converted into drugs such as coca paste, opium and marijuana. Over the years, these crude products were further processed to drugs like cocaine and heroin and finally, in the 20th century, people found out how to make drugs from chemicals.

These are called man-made or synthetic drugs and include ecstasy, LSD, etc. These were initially manufactured for largely experimental reasons and only later were used for recreational purposes. Now, however, with the increased size and scope of the drug trade, people set out to invent drugs especially for human consumption.

For the first time in human history, a whole industrial complex creates and produces drugs that are meant to be used for the sole purpose of «having fun». People use drugs just to escape the reality, to have fun. The majority of them are young, even very young, who do not understand what might happen to them because of drugs.

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Rats (Крысы)

Attempts to reduce the rat population have consistently end up in failure, and environmental experts have explained this fact by claiming that rats have developed a resistance to poisons. However, recent research refutes those findings and according to French scientists, rats are much cleverer than people thought.

Michael Dansel, who has studied rats for 20 years, says that the rats have an ability to communicate their thoughts. He believes that rats

are the most intelligent mammals after man and the chimpanzee and that the rats' ability to adapt suggests a very sophisticated nervous system. For example, when a new rat poison was placed in a Paris sewer, the news travelled so effectively through the rat population that within a few hours not a single rat would touch it, no matter where in the sewer network it was placed.

When earlier poisons were used, rats simply developed a resistance to them. And scientists have now found that rats have a more sophisticated means of defence. Faced with new and more powerful poisons, the rats quickly discovered what human chemists have known for only a few decades: that vitamin K can be used as an antidote. Now, they protect themselves by consuming substances containing vitamin K.

One of the most troubling discoveries is that rats are able to pass knowledge down through generations extremely quickly. It appears, that at three months they can give birth to as many as 14 offspring at once. In a good year one pair and its offspring might produce 1,000 descendants, all with an extraordinary ability to learn from their parents.50 years of human life is the equivalent of 7,000 years for the rat. And in 7,000 years, man can learn a lot too.

According to Michael Rampaud, rats have an excellent ability to transmit a strong mistrust of new substances to their offspring and they are very shy of anything new placed in its territory. For example, when the rat encounters a new substance it may eat only a very small quantity; in the case of a poison, it is enough to cause sickness but not enough to kill it. If this happens, then the rat will avoid the poison and refuse to let others near it.

One of the rat's best survival techniques is its ability to alter its diet. The modern urban rat now has a liking for plastic, which it has learned to digest and use for energy – something it was unable to do a few decades ago. This is very bad news for businesses because rats can easily eat through telephone cables, destroying electronic networks and causing hundreds of thousands of dollars worth of damage.

These new insights into the wild rat come at a time when their population is increasing in Europe. Several mild winters have allowed rats to breed all year round, and rubbish on the streets from the fastfood culture has given them a plentiful food supply. It is estimated that there are up to six million rats in Paris and some ten million in London. To fight this population explosion, poison manufacturers are trying out a new product that takes three to four days to kill a rat. Tests show that it bypasses the rat's defence mechanism because the animal does not relate its illness to eating the poison and it does not spread the message to other members of the colony. The Eurorat may have been outsmarted... at least for the moment.

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What do you know about PETA? (Что вы знаете о PETA?)

People for the Ethical Treatment of Animals (PETA) is the largest animal rights organization in the world, with more than 3 million members and supporters. The slogan of the organization is: Animals are not ours to eat, wear, experiment on, or use for entertainment.

PETA was founded in 1980 and is dedicated to establishing and defending the rights of all animals. PETA educates policymakers and the public about animal abuse and promotes kind treatment of animals. PETA is an international nonprofit charitable organization based in Norfolk, Virginia, with affiliates worldwide. PETA believes that animals have rights and deserve to have their best interests taken into consideration, regardless of whether they are useful to humans. Like you, they are capable of suffering and have an interest in leading their own lives.

The very heart of all of PETA's actions is the idea that it is the right of all beings — human and nonhuman alike — to be free from harm. Our world is plagued with many serious problems, all of which deserve our attention. Cruelty to animals is one of them. They believe that all people should try to stop animal abuse whenever and wherever they can.

PETA works through public education, cruelty investigations, research, animal rescue, legislation, special events, celebrity involvement, and protest campaign.Today it focuses on four core issues — opposition to factory farming, fur farming, animal testing, and animals in entertainment. It also campaigns against eating meat, fishing, and the killing of animals regarded as pests, the keeping of chained backyard dogs, cock and dog fighting, and bullfighting. PETA opposes the use of animals for producing clothing made with fur, leather, wool, or silk. It also opposes the use of down from birds and the use of silk from silkworms or spiders.

Around 50–100 million vertebrate animals are used in experiments annually. Animal testing, also known as animal experimentation, animal research, and in vivo testing, is the use of non-human animals in experiments. Accurate global figures for animal testing are difficult to obtain. The British Union for the Abolition of Vivisection (BUAV) estimates that 100 million vertebrates are experimented on around the world every year, 10–11 million of them in the European Union. The Nuffield Council on Bioethics reports that global annual estimates range from 50 to 100 million animals. None of the figures include invertebrates such as shrimp and fruit flies. Also not included in the figures are animals bred for research and then killed as surplus, animals used for breeding purposes, and animals not yet weaned.

Cats are most commonly used in neurological research. 24,221 cats were used in the U.S. in 2013, around half of whom were used in experiments which have the potential to cause "pain and/or distress".

Dogs are widely used in biomedical research, testing, and education — particularly beagles, because they are gentle and easy to handle. They are used as models for human and veterinary diseases in cardiology, endocrinology, and bone and joint studies, research that tends to be highly invasive, according to the Humane Society of the United States. The most common use of dogs is in the safety assessment of new medicines for human or veterinary use as a second species following testing in rodents, in accordance with the regulations set out in the International Conference on Harmonizationof Technical Requirements for Registration of Pharmaceuticals for Human Use. The U.S. Department of Agriculture's Animal Welfare Report shows that 67,772 dogs were used in USDA-registered facilities in 2013.

A cosmetic testing on animals is particularly controversial. Such tests, which are still conducted in the U.S., involve general toxicity, eye and skin irritancy, photo toxicity (toxicity triggered by ultraviolet light) and mutagenicity. A cosmetic testing on animals is banned in India, the European Union, Israel and Norwaywhile legislation in the U.S. and Brazil is currently considering similar bans.

In 2002, after 13 years of discussion, the European Union agreed to phase in a near-total ban on the sale of animal-tested cosmetics by 2009, and to ban all cosmetics-related animals testing. The ban is also opposed by the European Federation for Cosmetics Ingredients, which represents 70 companies in Switzerland, Belgium, France, Germany, and Italy. In October 2014, India passed stricter laws that also ban the importation of any cosmetic products that are tested on animals.

In Russia, there is a similar public organization called VITA Animal Rights Center, which opposes animal cruelty.In today's world of virtually unlimited choices, animal exploitation is simply unacceptable. We can eat better, educate ourselves better, clothe ourselves better, and entertain ourselves better without torturing and killing animals.We have the power to spare animals excruciating pain by making better choices about the food we eat, the things we buy, and the activities we support.

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Stress and techniques to overcome it (Стресс и методы его преодоления)

No one can live without experiencing some degree of stress. Physiological or biological stress is an organism's response to a stressor such as an environmental condition. Stress is a body's method of reacting to a challenge. According to the stressful event, the body way to respond to stress is by sympathetic nervous system activation which results in the fight-or-flight response. Because the body cannot keep this state for long periods of time, the parasympathetic system returns the body's physiological conditions to normal (homeostasis). In humans, stress is typically described as a negative condition or a positive condition that can have an impact on a person's mental and physical wellbeing. Stress may be physical or psychological. Physical stress is the result due to the sense of hunger, thirst, heat, cold, infections. Psychological stress is the result of severe nervous overstrains.

Stress is known as a calm killer No.1 in modern society, because it is associated with a great number of causes of death (80% of diseases result from the fact that human organism is not able to cope with stress). Stress and its consequences are phenomena that are directly associated: the longer and stronger is the negative effect of stress, the more negative impact it produces on the human organism.

Psychologists have developed a number of techniques that help to overcome stress.

1) One of the most popular methods is positive visualization. The use of positive visualization allows to get rid of negative emotions. It is based on reconstruction of unpleasant situation but with certain corrections. For example, psychologists recommend to imagine a person who offended you in some funny hat or absurd suit. The reconstructed image is not of great importance in such a situation but the result that may made you laugh or change your attitude is of great value.

2) Sleep allows people to rest and reenergize for another day filled with interactions and tasks. If someone is stressed it is extremely important for them to get enough sleep so that they can think clearly.

3) The other way of controlling stress is a recommendation of developing a so-called "an outlook from the balcony". It means that you are advised to look at the problem from above. If we stand at a balcony and look downward all people seem very small and short. The problems person faces may turn out to be less significant and less meaningful.

4) Another way to manage stressful situations is develop an outsider outlook on life problems and become a passive spectator at the theatre of life.

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The energy drinks influence on the living organisms (Влияние энергетических напитков на живые организмы)

It is an open secret that today in Russia the consumption of the energy drinks becomes very often and is turned to be usual. The target public of tonic beverages is young people. It is a well-known fact that uncontrolled consumption of tonics leads to hypertension and diabetes mellitus. In practical medicine many cases of visceral organ disease have been observed. All drinks contain **preservation agents** helping food to be conserved as well as colorants and aromatics which give beverages not only necessary tinge and flavor but may also have a negative impact on the human's body.

The aim of the work is the estimation of the energy drinks influence on the living organisms.

While carrying out the research, the following materials were used: universal indicator paper, medical flasks and droppers, energy tonics. The target of research was Angora aged three months hamsters.

At the beginning of the experiment, during seven days we observed two hamsters, which were active, vigorous and cheerful. On the eighth day, one of the participants was instilled one drop of energy drink, and further, the dose was increasing by one drop every day bringing the quantity of drops up to six. The second testee was instilled nothing. The calculations were made out of ratio of caffeine norms to live weight. The average of caffeine corresponded to one hundred of the drink: 35 mg of the norm is equal to 0.369 g. One drop contained approximately 0,06485 ml of the drink. These data served as a basis for the calculations. The observations had shown that the first testee had insignificant changes after the first drop was taken. After the intake of the second drop the aggression appeared. On the third day of the third intake, the hamster showed the **doubling** of **aggression**, and with the fourth dose it attacked the other hamster. The administration of the five drops on the 5th day the hamster lost its activity and started to look noticeably ill. On the 6^{th} day, it refused to eat and it moved with difficulty and reacted on the environment with fear.

After the following experiment, we have come to the conclusion that the energy drinks influence negatively on the living organisms. It also speaks for the necessity of careful consumption of these products by people, having gastrointestinal diseases. The consequences of such consumption might be very serious up to the fatal case. Therefore, it should be noted that drinking the energy beverages must be controlled.

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Vitamins (Витамины)

Vitamins are believed to belong to ancient elementary organic compounds and to exist before live originated on Earth. According to Academican Chagovets vitamins took part in the building up of as primary organism together with such "blocks" of lying matter as nucleic acids, proteins aminoacids.

Like the hormones, vitamins are considered to be very potent, and daily intake of the order of 0,1 to 5 mg is 2 adequate except in the case of vitamin C of which much larger amounts are required. In addition to being "accessory food factors" necessary for the maintenance of health and indeed for life itself, the synthetic vitamins are now recognized as being valuable therapentic agents for the treatment of deficiency syndromes and as such they may legitimately be considered as drugs.

The vitamins as a class are not chemically related, and they are classified according to their solubility and chief therapeutic effect into two groups: 1) water – soluble vitamins. 2) fat – soluble vitamin group. It is known to be essential for the maintenance of normal epithelial tissue.

Vitamins A is an unsaturated cyclic alcohol. It is synthesezed by at least three separate processes.

It has been concentrated and isolated from the non – saponiflable to be present in fish oil, both in the free alcohol and in the ester form. The source of all vitamin A is in the carotenoid pigments, the yellow – coloured, compounds occurring in all chlorophyll – containing plants.

In pure form it is a pale yellow oil, soluble in fat solvents, having an ultra - violet absorption spectrum. The ester forms of the vitamin have been found to possess greater stability than the free alcohol.

Vitamin B1, Vitamin B2, Vitamin B6, Vitamin B12, Vitamin C and other are stated to belong to the water – soluble vitamin class. Vitamin B2 (riboflavine) is built up from a ribose and isoalloxazine residue, the name riboflavine being derived from the sugar component and the intense yellow fluorescence of it's agucous solution. It is of wide occurrence in, nature and constitutes a component of the flavin coenzome systems.

Vitamin C (ascorbic and acid) is essential for the normal functioning of living cell and is involved in many enzymatic reactions. It is required for the development of cartilage, teeth and bones, for wound healing and aiding the absorption of iron from the intestin. Gross deficiency causes scurvy.

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Natural antibiotics (Природные антибиотики)

Medicine is constantly developing and more effective drugs appear every year. But very often the most powerful cure provides the strongest side effects.

Now among drugs antibiotics are quite popular. But the uncontrolled use of antibiotics can have harmful affect both on the organism, and on the diseases which have to be cured. Antibiotics kill the live pathogenic microorganisms causing an illness. But also they kill some useful bacteria. As a result the excessive use of such preparations can damage the work of immune system, which can cause diseases. Natural antibiotics have no side effects. They also contain substances, the killing harmful microorganisms, but at the same time their action doesn't extend to other bacteria. At the regular use in food these products make our immunity stronger, don't allow microbes to get into our organism. They are especially actual at present when there are more and more infections which won't respond to treatment by usual antibiotics.

Quite a large number of natural products have antibiotic action, first of all, garlic, onions and ginger.

Specific taste of garlic is caused by essential oil - allicin which is a very powerful antioxidant. Allicin is produced in tissue. In a dosedependent manner allicin can inhibit the proliferation of both bacteria and fungi or kill cells, for example, methicillin-resistant Staphylococcus aureus. Furthermore, in mammalian cells, including cancer cells, allicin induces cell-death and inhibits cell proliferation. In sub-lethal concentrations, allicin has a variety of health-promoting properties, for example, cholesterol- and blood pressure-lowering effects that are advantageous for the cardio-vascular system.

Onions contains natural antibiotic - phytoncide. Phytoncide is a biologically active substance of plant origin that kills or inhibits the growth and development of bacteria, microscopic fungi, and protozoa. This natural antibiotic is ruthless to sreptococcus, a diphtheritic, tubercular and dysenteric stick.

The anti-inflammatory properties of ginger have been known and valued for centuries. Ginger contains methicillin, amoxicillin and penicillin – three of the most successful antibiotics in our pharmaceutical arsenal.Ginger helps prevent or treat nausea and vomiting. It is also used as a digestive aid for mild stomach disorder, to reduce pain of osteoarthritis, and has even been beneficial fighting heart disease and cancer.

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Army ants (Кочевые муравьи)

Ants have been on Planet Earth for more than 140 million years. The name army ant (or legionary ant or marabunta) is applied to over 200 ant species, in different lineages, due to their aggressive predatory foraging groups, known as "raids", in which huge numbers of ants forage simultaneously over a certain area. Another shared feature is that, unlike most ant species, army ants do not construct permanent nests: an army ant colony moves almost incessantly over the time it exists. All species are members of the true ant family, Formicidae, but several groups have independently evolved the same basic behavioral and ecological syndrome. This syndrome is often referred to as "legionary behavior", and may be an example of convergent evolution. Legionary ants - are one of the most famous. They are also called ant killers because during their movement they kill all arthropods, small rodents and reptiles in the territories, which are. Army ants are incredibly clever and can move very quickly, some army ants also own slaves. They are found in the Amazon rainforest. The Amazon workers are all soldiers, and so they cannot gather food or take care of the young.

So they must raid other ants to get slaves who will do this work. They usually raid the nests of small, black ants. They kill any ants who try to resist them. Then they take the cocoons and larvae to their own homes. When the black ants come out of the cocoons, they will work in the Amazon colony, just like slaves.

Colonies of real army ants always have only one queen, while some other ant species can have several queens. The queens of army ants are unique in that they do not have wings, have an enlarged gaster size and an extended cylindrical abdomen. They are significantly larger than worker army ants and possess 10–12 segments on their antennae. Queens will mate with multiple males and because of their enlarged gaster, can produce 3 to 4 million eggs a month, resulting in synchronized brood cycles and colonies composed of millions of individuals all related to a single queen. When the queen of an army-ant colony dies, the workers may join another colony. In other cases, when two colonies of the same species meet, they usually change the marching direction to avoid conflicts. © Махмутова Лилия, 2016

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The influence of selenium on the human body and the prospects on food products usage (Влияние селена на организм человека и перспективы его использования в продуктах питания)

Selenium is one of micronutrients necessarily present in any part of the body in selenocontained proteins. Selenium is an integral component of more than 30 essential biologically active compounds of the human body. The total amount of selenium in the human body is 10-14 milligrams, and the average human need in selenium ranges from 70 to 100 micrograms. The greatest amount is concentrated in liver, kidney, spleen and testis. The main source of selenium is seafood, poultry and animals, as well as cereals.

Effects of selenium on the human body is not enough studied. It is known that selenium compounds are highly toxic poisons. Other facts confirm its indispensability in the body. For example, with the help of selenium light is transformed into nerve impulses to retina.

Since 1979, thanks to American scientists' research at Cornell and the University of Arizona, selenium gained a reputation of a powerful anticancer agent having strong antioxidant properties which can be used for the prevention of various diseases.

Clinical effect of selenium action depends on the composition in which it is introduced into the body. In combination with ascorbic acid (vitamin C) and tocopherol (vitamin E) selenium steel used to prevent major causes of visual impairment and blindness of the elderly people.

The deficiency of selenium is characterized by such diseases as nausea, diarrhea and vomiting combined with dryness of the skin and hair loss. The inorganic forms of selenium are more toxic than organic. Therefore, for the prevention of selenium deficiency organic forms of selenium are used. "Nutrikon-Selenium" was the first domestic specialized product that contained bioorganic selenium form. The structure of "Nutrikon-Selenium" is rich in selenium food micro-algae Spirulina and a number of other plant antioxidants.

An attempt was made to introduce selenium compounds in the process of brewing beer. In particular, this was the basis of the development of new technology and new food product, namely the light beer "Lunnoe". There are some recommendations for the use of selenium drinking water and bread enriched with selenium. However, they have not been applied yet.

It is also known that some plants with excessive amounts of selenium can be poisonous for people.

Selenium is a trace element necessary for the humans, but the consumption of it should be carefully monitored. The use of dietary supplements with selenium is allowed only if there is the risk of developing clinical manifestations of its deficiency.

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The mammoth museum in Khatanga (Музей мамонта в Хатанге)

In the far Polar settlement Khatanga you can find a mammoth museum, which is situated in a cave, excavated in layers of ancient permafrost. The museum contains a marvelous collection of exhibits picked up on a large land of Taimyr, – it represents invaluable scientific material for qualified biologists, paleontologists, geneticists and paleogeographers from around the world.

It all started when two reindeer-breeders found two tusks in tundra – it happened in the middle of 90s of the last century on the bank of the river Kyrsa-Yuryakh. During a year these tusks were passed from hand to hand until the head of Administration of Khatanga, – Nikolai Fokin, learnt about them. He proposed the idea of creating a museum of mammoth and he was supported by other people. One of them was Bernard Buigues, the head of the French tourist company "Parallel-90". Thus, the story of "Mammuthus" program began, its main objective is the collection and conservation of remains of mammoth fauna, and the also selection of a variety of biological samples for research works aimed at increasing the opportunities for possible cloning a mammoth.

Thus, in a steep bank of the river Khatanga there arose a separate grotto, where parts of bones, teeth and tusks of mammoths and other ancient animals of Taimyr of were collected. Almost all the locals were attracted to work. For the first few years, one hundred and fifteen tusks were collected in the Taimyr tundra.

The greatest scientists in the field of paleobotanists, paleontology, genetics, parasitology and other branches became active participants of the "Mammoth programs".

Among them is a scientist well-known in the Russian Federation Nikolai Kuzmich Vereshchagin, who during his life excavated more than 150 mammoths; Professor from France, the main specialist on primitive man and mammoth fauna Yves Coppens; a well-known researcher of serotinal Pleistocene period, Dick Mole; Professor Larry Agenbrod from the United States; Secretary of the Mammoth Committee RAS Tikhonov.

The main exhibit of the museum became a mammoth, which was found by reindeer-breeder Alexei Zharkov not far from the Kyrsa-Yuryakh river. It is also called "mammoth Zharkov." According to reliable information of radiocarbon analysis, which was conducted in the Netherlands, the age of the animal calculated up to the present day) was determined as 20380 years.

Since 2004, the expedition called "Mammuthus" the continued its own work in Yakutia and later in Yamal. The foundings of scientists, were exhibited in many world countries.

At the moment the mammoth museum in the settlement Khatanga can pass under the control the FGBI "Joint directorate of nature reserves of Taimyr".

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Method of circular training, an innovative form of training of athletes in higher education institutions (Метод круговой тренировки как передовой способ подготовки спортсменов в Вузах)

Method of circular training is one of innovative technologies in education and training in the physical culture considering a freedom of choice, forms, intensity of physical activity at obligatory implementation of the set educational standards. The essence of the circular training is circular performing of specially chosen exercises for consecutive impact on all main muscular groups.

In physical training circular training gives the chance to learn independently, to form physical qualities, to improve separate skills. In this process one of important tasks for the teacher consists in modeling special complexes and developing the algorithmic instruction, as well as ability to organize and operate independent student's activity in class.

When modeling circular training power exercises, exercises for speed, flexibility, endurance and dexterity are used.

Teaching physical education in a higher education institution such circular form of training is of particular importance as it allows a large number of students to practice at the same time and independently, using maximum quantity of stock and equipment.

Advantage of circular training allows concentrating on accurate conscious and correct performance, it becomes simpler in view of lesser counting and becomes available to those who do circular training for the first time; arrangement and control become easier; independence is cultivated, the role of groups initiative rises.

Thus, introduction of circular training into the training process undoubtedly yields positive results and promotes successful development of physical education in general.

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Malformation of cerebral vessels (Мальформация сосудов головного мозга)

Malformation of cerebral vessels is an inborn pathology of the circulatory system. It is incorrect connection of veins, arteries and small blood vessels. Usually the disease reveals between the ages of 10 to 30 years, but there were cases of malformation diagnosed in adulthood.

All the parts of the brain have the risk of malformations, but the largest formations are found in the back sides of both hemispheres.

Often half of patients have cerebral hemorrhage. Usually it is small. Hemorrhage may be massive in rare cases. Then it can be fatal.

Possible symptoms of AVM include headaches, weakness and decreased performance. In one third of cases epileptic seizures occur, that can have simple and complex forms.

Arteriovenous malformation of cerebral vessels appears as a result of the prenatal injury and developmental disorders of the fetus, but the reasons for this phenomenon are unclear. At the moment there are only two main risk factors. These factors are being male and genetic predisposition. A low knowledge of the problem due to lack of resources leads to the emergence of new hypotheses.

Sometimes arteriovenous malformation does not have symptoms for a long time, so patient may not notice this problem. Often the reason for going to the doctor is the gap of small or large vessel which is accompanied with intracerebral hemorrhage.

In some cases treatment of malformations may be confined to constant observation of the patient, including a comprehensive survey of the organism. Radical methods include three options. The first is a surgical removal. Doctors perform open brain surgery. In endovascular embolization they use a catheter that is inserted into the artery, it reaches the brain arteries and blocks blood flow. And the third option is stereotactic radiosurgery. It uses focused radiation that destroys the malformation over a period of months or years. In our time people actively use a combination of methods of treatment. It can significantly reduce the risk of complications and increase the radicality of the intervention in the organism.

Today arteriovenous malformation of cerebral vessels is not studied enough and people could not prevent its appearance. But scientists continue to study it. And this research can give us new methods of treatment.

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Саетгалиев Эльдар

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Alternative Energy in Russia (Альтернативная энергия в России)

Solar energy has great potential, but is not yet put into practice fully. It is due to the lack of the necessary legislation allowing private producers to trade in electricity produced from sunlight. In addition, the use of photovoltaic systems (PVS) requires significant investments, and the payback period is highly dependent on weather conditions. However, alternativesolar energy may be the only solution for remote sites in Russia. The greatest potential for solar energy has the Krasnodar, Stavropol, Magadan regions and Yakutia. According to statistics, today about 10 million people in Russialive without centralized power; and so it makes you wonder about the necessity of development of the industry. Certain developments in this direction have alreadybeen done in Russia: there are companies that own the PVS production technology and equipment to produce electricity. One of the positive examples of the use of solar energy is a solar power plant, located in Belgorod region (Yakovlevsky area farmhouse Krapivenskiye Yards) with a nominal capacity of 0.1 megawatts.

The development of wind energy in Russia is far behind the level of that in developed countries, where itprovidesup to one third of the countries' needs in electricity. The level of investment for the construction of "windmills" is relatively low: it is supposed to attract investors interested in small business. Today, Russia operates long-standing and out-of-date wind turbines. The largest is a wind farm "Kulikovo", located near Kaliningrad. Its capacity is 5 megawatts. In the near future it is planned to increase its capacity by four times. In addition, wind energy is used in WEC Tyupkildy (Bashkortostan), Marposadskaya (Chuvashia) and Kalmykia VES.The following work independently: Anadyr, Polar, and Nicholas Markinskaya wind power stations. Today small wind turbines are installed for cottage settlements and small industrial enterprises.

Biogas is formed by the decomposition of any organic waste. This fermentation product contains methane and carbon dioxide with small amounts of other substances. To get fossil fuel carbon dioxide isto be removed. Any biomass can be the raw material: beet pulp, waste meat processing plants and fish processing plants, manure, grass clippings and fallen leaves, as well as household and fecal waste (the list goes on). The amount of organic waste in our country reaches 620 - 630 million tonsevery year. With the help of this waste we can produce up to 30 million cubic meters of gas, burning of which can produce up to 70 gigawatts of electricity. Power plants in Russia use biogas extracted from peat, plant and wood waste. Over the past decade, the list of companies producing biogas installations grew longer.

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Impact of maximum doses of dopamine on morphostructural characteristics of myocardium of line WAG / Rij rats (Влияние максимальных доз дофамина на морфоструктурные характеристики миокарда крыс линии WAG/Rij)

Dopamine plays a key role in the functioning of the dopaminergic and cardiovascular systems. WAG / Rij line rats are affected by a disorder of the dopaminergic system of the brain, which in turn affects other body systems. For this reason, our study is aimed at investigating the morphostructural characteristics of rats' myocardiums after their having been administered dopamine in a single and in multiple periodical injections (control group, acute and chronic experiments). The study was performed on adult male WAG / Rij line rats (n = 30, m = 200-220g). During the acute experiment, the rats were once intraperitoneally injected with a 10 mcg / kg dose of dopamine (causing α - and β -adrenergic receptors to be stimulated). The organic material has been collected 24 hours and a month after the injection. During the chronic experiment, the same dose of dopamine was administered during a two-weeks period, 3 times a day. The material has been collected a month after the injections. Decapitation has been later performed on the subjects under the effect of ether anesthesia. Paraffin sections (10 microns) have been painted by Van Gieson's method, and with hematoxylin and eosin.

The results of the experiment in the control group showed a well-defined structure of myocardial cells, cardiomyocytes were distinctly separated by cell membranes, there were no signs of swelling and there were no changes in the blood flow. 24 hours after the injections the cardiomyocyte structure and cross striations of myofibrils maintained their characteristics. Inflammatory infiltrations of macrophages, lymphocytes, mast cells and Anichkov cells have been observed to gather around the blood vessels. A month after the administration of the drug the signs of Zenker's necrosis of the cardiomyocytes were observed, as a result of myofibrils' lysis and necrosis. The gaps between the cardiac fibers were expanded, due to the accumulation of large vacuoles, resulting from the outflow of fluid caused by distrurbances in the microcirculation and by vascular thrombosis. Massive macrophage-fibroblastic infiltrations with a predominant presence of fibroblasts has been revealed. This indicates the beginning of the proliferative stage of inflammation, which can provoke cardiosclerosis. In the chronic experiment notable changes in ventricular myocardium structure have been observed (especially on the pericardium side). Cardiomyocytes increased in their size and their cross striations were missing in some spots. The presence of edema and vacuoles are signs of hydropic dystrophy. After a microscopy analysis, signs of vessel sclerosis, as well as the effects of moderate fibrosis have been found in the intracellular space.

According to our findings, the administration of dopamine causes morphological myocardial structural changes that might result in a heart failure.

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The problem of experimental studies on animals (Проблема экспериментальных исследований на животных)

The development of biomedical research in the twentieth century has led a huge number of experimental animals in the world every year. Experimental research with animals is usually conducted in universities, medical schools, pharmaceutical companies, defense establishments that provide animal-testing services to industry.

Experimental animals are subjected to different damages, poisoning and diseases, they are beaten with electric shocks and addicted to drugs. They are also subjected to temperatures close to freezing, they are grown from birth in total darkness. During military experiments they are poisoned by gases and cyanides.

Tens of millions of laboratory animals are killed a year. The bulk of animal studies in medicine is 65%. In fundamental scientific research 26% of the total number of experimental animals are used. For testing toxicity in other spheres besides medicine, it is 8% and for education - 1%.

Animal testing is not only unreliable, but also cruel. There are a lot of examples of what happens in cosmetics laboratories. This area of experimentation is not related to the preservation of life and health of people, so the movement started under the slogan "Beauty without cruelty".

It is believed that we cannot do without research on animals. But the analysis of achievements of modern medicine has shown that progress is associated with clinical observations of patients, not animal experiments. We are talking about such diseases as typhoid, ulcerative colitis, hepatitis, rheumatism, cancer, AIDS.

Today single-celled organisms can be used as an alternative animal. There are the embryo eggs, bacteria, physico-chemical models, cell culture, computer models. These techniques are cheaper, more efficient and can reveal toxicity of the tested drugs on a more profound level.

Currently, there are such organizations for the protection of animals as "International Association against painful experiments on animals (IAAPEA)", "Doctors against animal experiments", "The British Union for the abolition of vivisection (BUAV)", "InterNICHE", Russian organization "Vita", "Alliance for animal rights", etc. They use mass media to disseminate information on alternative experimental methods not involving the usage of animals, they help to prevent cruel tests and experiments on animals, have an impact on producing companies, policy, legislation.

In addition to animal defenders among the opponents of the experiments there are philosophers, biologists, veterinarians, physicians. Overall, the pressure to limit the use of animals in research is rising. Meanwhile, the use of animals in many areas of life-science research is on the decline, experts note. So let us be more sensible to approach the issues of the experiments.

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Baby's nutrition (Детское питание)

Rational baby's food is one of the basic conditions for normal growth, physical and neuron and psychological development, high resistance to various diseases and other harmful environmental factors.

Balanced diet is of great importance, especially for young children due to their anatomical and physiological peculiarities. Rational baby's nutrition is one of the basic conditions for normal growth, physical and neuron-psychological development, high resistance to various diseases and other harmful environmental factors.

For a newborn baby and a child of the first six months of life, errors in nutrition are particularly unacceptable, because of immaturity of the organism as a whole and of individual organs. Best food for children of this age is their mother's milk (provided that the mother is healthy and receives adequate nutrition). However, in some cases, the lack or absence of mother's milk or the inability to provide the child with the donor's milk is the main reason to switch the child to mixed or artificial feeding, using the so-called breast milk substitutes. Dairy baby's food is products that provide a child with basic food ingredients, depending on the age. Particular attention is paid to products for children during the first three months of life, when the lack of mother's milk has the most negative impact on the child's health.

Baby food is classified according to the age group:

1. Infancy – from birth to one year;

2. Tender age – from one to three years;

3. Pre-school age – from 3 to 7 years;

4. School age – from 7 to 11 years;

5. High school age – from 11 to 14 years;

The ratio of protein diets, fats and carbohydrates should be: for infants 1: 2: 5, preschool age is 1: 1: 3, and for school age is1: 1: 4 respectively. These proportions differ from those of cows' milk. Therefore, cow's milk, when it is used for children's and dietary food should be subjected to quantitative and qualitative correction, because the mass fraction proteins in cows' milk is 3 times more than in human's. The ratio of caseins and whey protein in human's milk is about 40:60 and 80:20 in cow's milk.

In our country baby food production is fully organized on 28 processing plants. However, the need for specialized products for children is met by only 25-40%. Besides the raise in supplies baby's food will not solve the problem in the long-term because not all imported baby's food satisfy our country's requirement norms and standards.

As a result about 50% of children under two years do not receive food in sufficient quantities. Another big problem is nutrition of newborns. Nowadays more than 60% of such babies need artificial feeding. Besides, the amount of children suffering from such diseases as: rickets, different kind of allergy, anemia and etc.) is increased by 20%.

According to the State Sanitary Service of the Russian Federation, 7% from 70 thousand of baby's food samples do not meet the medical and biological requirements and hygienic standards. It should be noted that a number of domestic products in terms of quality is not inferior to foreign ones, and in many respects even superior to them (e.g. some substitutes for human milk, canned meat, and others.).

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Modern prospects of amaranth (Современные перспективы амаранта)

Amaranth is an upright, moderately tall, broad leafed, annual plant. There is a number of different species of amaranth and a huge number of varieties within those species.

Amaranth comes in all sizes, shapes and colours. The leaves can be round or lance shaped, five to fifteen cm long or more, light green, dark green, reddish or variegated. Seeds maybe white, yellow, pink or black. Flowers can be striking. Several species are often considered weeds, but people around the world value this plant as leaf vegetables, cereals and ornamental plants. Amaranth seeds have been used since ancient times in Central and Latin America, they once was a staple in the diets of pre-Columbian Aztecs.

The plant has a very nutritious grain and leaf. The youngest leaves have a milder flavor and are good to use in salads. Leaves are an excellent source of carotene, iron, calcium, protein, vitamin C and trace elements. For example amaranth leaves contain three times more calcium and three times more niacin than spinach leaves.

Amaranth seeds are also high in potassium, zinc, vitamin B and E and contain over 20% protein. Compared to other grains amaranth seeds have a much higher content of the minerals magnesium, iron and of the amino acid Lysine.

The grain of amaranth has been used for food by humans in a number of ways. The most common usage is to grind the grain into a flour for use in breads, noodles, pancakes, cereals, granola, cookies, or other flour-based products. More than 40 products containing amaranth are currently on the market in the U.S.A.

Amaranth is a very useful tool in the genetic research. Scientist have developed protein rich potato variety by incorporating the gene AmA-1 from amaranths. As s donor gene, the AmA1 gene has several advantages for genetic transformation experiments. First, this seed protein has a well-balanced amino acid composition, making it nutritional-
ly superior to other proteins. Second, the purified protein has no known allergenic properties. Finally, the protein is controlled by a single gene, which facilitates integration into other species. Transgenic lines potato contained a significant two- to four-fold increase in lysine, cysteine, methionine, tyrosine content in their protein amino acids.

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Landmark migratory birds (Ориентация миграционных птиц)

Bird migration is the regular seasonal movement, often north and south along a flyway, between breeding and wintering grounds. Many species of bird migrate. Migration carries high costs in predation and mortality, including from hunting by humans. Migration is driven primarily by availability of food. It occurs mainly in the northern hemisphere, where birds are funnelled on to specific routes by natural barriers such as the Mediterranean Sea or the Caribbean Sea.

Historically, migration has been recorded as much as 3,000 years ago by Ancient Greek authors including Homer and Aristotle, and in the Book of Job, for species such as storks, turtle doves, and swallows. More recently, Johannes Leche began recording dates of arrivals of spring migrants in Finland in 1749, and scientific studies have used techniques including bird ringing and satellite tracking. Threats to migratory birds have grown with habitat destruction especially of stopover and wintering sites, as well as structures such as power lines and wind farms.

The Arctic tern holds the long-distance migration record for birds, travelling between Arctic breeding grounds and the Antarctic each year. Some species of tubenoses (Procellariiformes) such as albatrosses circle the earth, flying over the southern oceans, while others such as Manx shearwaters migrate 14,000 km (8,700 mi) between their northern breeding grounds and the southern ocean. Shorter migrations are common, including altitudinal migrations on mountains such as the Andes and Himalayas.

The timing of migration seems to be controlled primarily by changes in day length. Migrating birds navigate using celestial cues from the sun and stars, the earth's magnetic field, and probably also mental maps.

Researchers in Russia investigated the map issue in a past study by capturing Eurasian reed warblers on the Baltic Sea as they flew northeast towards their breeding grounds near Saint Petersburg. They moved the birds 600 miles east, near Moscow. And the birds just reoriented themselves to the northwest — correctly determining their new position.

Now the same scientists have repeated that experiment—only this time, they didn't move the birds at all. They just put them in cages that simulated the magnetic field of Moscow, while still allowing the birds to experience the sun, stars and smells of the Baltic. Once again, the birds re-oriented themselves to the northwest—suggesting that the magnetic field alone—regardless of smells or other cues, is enough to alter the birds' mental map. The study is in the journal *Current Biology*. [Dmitry Kishkinev et al, Eurasian reed warblers compensate for virtual magnetic displacement].

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The use of energy. The concept of breathing (Использование энергии. Процесс дыхания)

Energy is the ability to perform external work and survival of the organism itself. Energy exists in different forms — chemical, electrical, mechanical, light and heat. We should know how to use these different forms of energy in living organisms and give examples of this. Issues related to energy are of paramount importance in biology. All living systems from cells to ecosystems require energy to do their work. Any

cell will die very quickly, if you deprive it of energy (we will see below that this is easy to do with aerobic cells, if they are affected by cyanide), so will die and any ecosystem, if continuously flowing stream of solar energy is interrupted. Nutrition is the process that delivers a living organism with all necessary energy. From food the body draws materials to build and repair cellular structures. However, the energy contained in nutrients, must be translated into a form that is able to use by the cells. This function is performed by the breathing process.

What is breathing?

Breathing is the process in which the oxidation of organic matter releases energy. This energy becomes available for living cells in the form of ATP. When this biochemical process occurs in the cells, it is called cellular respiration. If a cell needs oxygen, its respiration is called aerobic; if the reactions proceed in the absence of oxygen, we speak of anaerobic respiration. Thus only respiration provides energy for living beings. Such energy can be referred to as biological energy. Substrates for cellular respiration are mostly carbohydrates (e.g., glucose) or fats. They are cleaved sequentially in a number of enzymatic reactions. Each reaction releases a small amount of energy and part of this energy is stored in molecules of substances called adenosintriphosphat the-fact (ATF), and the remaining energy is dissipated as heat. ATP in cells plays the role of an energy carrier. Energy enclosed in the molecules is used in the reactions with the consumption of energy.

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Dolphins "see" humans through echolocation (Дельфины «видят» людей с помощью эхолокации)

Researchers reproduced what a dolphin saw as it met a diver. This "what the dolphin saw" image of the submerged man reveals that *dolphin echolocation* results in fairly detailed images. What's more, it's now thought that dolphins may share such images with each other as part of a previously unknown marine mammal language.

Research team leader Jack Kassewitz said that "our recent success has left us all speechless. We now think it is safe to speculate that dolphins may employ a 'sono-pictorial' form of language, a language of pictures that they share with each other. If that proves to be true an exciting future lies ahead for inter species communications."

For the research, which took place at the Dolphin Discovery Center in Puerto Aventuras, Mexico, Kassewitz had colleague Jim McDonough submerge himself in front of the female dolphin "Amaya" in a research pool at the center. To avoid bubbles from a breathing apparatus (which might have hurt the later recreation of the image), McDonough wore a weight belt and exhaled most of the air in his lungs to overcome his natural buoyancy before positioning himself against a shelf in the pool.

As Amaya directed her echolocation beam to McDonough, high specification audio equipment was used to record the signal. Team members Alex Green and Toni Saul handled that part of the project.

Green and Saul then sent the recording to the *CymaScope* laboratory in the U.K., where yet another colleague, acoustic physics research John Stuart Reid, imprinted the signal onto a water membrane and then computer enhanced the resulting image.

"The ability of the CymaScope to capture what-the-dolphin-saw images relates to the quasi-holographic properties of sound and its relationship with water, which will be described in a forthcoming science paper on this subject," Reid explained.

His fellow teammates thought they had captured an echolocation image of McDonough's face, so that was what Reid was expecting to see. Instead, as he told Kassewitz in a note at the time, the signal translated to "what appears to be the fuzzy silhouette of almost a full man. No face."

As it turns out, Amaya had been echolocating on McDonough from several feet away before she came in closer, so the researchers captured one of those farther away signals.

Kassewitz said, "Having demonstrated that the CymaScope can capture what-the-dolphin-saw images, our research infers that dolphins can at least see the full silhouette of an object with their echolocation sound sense, but the fact that we can just make out the weight belt worn by Jim in our what-the-dolphin-saw image suggests that dolphins can see surface features too."

It could be that dolphin echolocation signals result in much clearer, more detailed mental images, and that it's our technology that isn't yet fully attuned to what the marine mammals are precisely seeing.

As Kassewitz said, "The dolphin has had around fifty million years to evolve its echolocation sense, whereas marine biologists have studied the physiology of cetaceans for only around five decades, and I have worked with John Stuart Reid for barely five years."

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The parasitic species Loa-Loa is threatening Africa (Паразитический вид Лоа-Лоа угрожает Африке)

Loa loa is one of the eight parasitic nematode (roundworm) species that account for most cases of filariasis in humans (this form of filariasis is sometimes known as loiasis), although it is responsible for less morbidity than are many of other seven species (notably, Wuchereriabancrofti and Brugiamalayi, which cause lymphatic filariasis, and Onchocerca volvulus, which causes onchocerciasis (river blindness)). Loa loa is endemic to Africa. In particular, loiasis is really endemic to just a few Central and West African countries, where it afflicts around 20 million people.

The insect vector (that carries the parasite) is the deer fly Chrysopswhich lives in swampy areas of the forest, principally in the Congo River region, Sudan, and Ethiopia. The adult worm wanders through the subcutaneous tissue butit is most obvious as it crosses the conjunctiva and can sometimes be seen moving through the sclera (white portion) of the eye hence leading to its common name, the African eye worm. Migration causes severe eye pain, inflammation, and sometimes blindness and may take a few minutes or up to several hours. Most cases of loiasis are asymptomatic. The first clinical signs may appear within a few months of infection, but often do not appear for more than a decade.

The primary vectors for Loa loafilariasis are two day-biting Chrysops deerflies, C. silacea and C. dimidiata. During a blood meal, an infected fly introduces third-stage filarial larvae onto the skin of the human host, where they penetrate into the bite wound. The larvae develop into adults that commonly reside in subcutaneous tissue, where they can live for several years. The female worms measure 40 to 70 mm in length and 0.5 mm in diameter, whereas the males measure 30 to 34 mm in length and 0.35 to 0.43 mm in diameter. Adults produce microfilariae measuring 250 to 300 µm by 6 to 8 µm, which are sheathed and have diurnal periodicity. Microfilariae have been recovered from spinal fluids, urine, and sputum. During the day they are found in peripheral blood, but during the noncirculation phase, they are found in the lungs. The fly ingests microfilariae during a blood meal. After ingestion, the microfilariae lose their sheaths and migrate from the fly's midgut through the hemocoel to the thoracic muscles of the arthropod. There the microfilariae develop into first-stage larvae and subsequently into third-stage infective filariform larvae. The third-stage infective larvae migrate to the fly's proboscis and, just a few weeks after the microfilariae were ingested by the fly, can infect another human when the fly takes a blood meal.

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Biological evaluation (Контроль и регистрация биопроцессов)

The environment is the key indicator of sustainable development. To obtain an objective conclusion about the quality of the environment it is necessary to carry out the integrated assessment of its condition, the whole complex of influences, all of the factors in interaction and ultimately get a total impact on the natural objects. Biological evaluation makes it possible to carry out integral characteristic of environmental quality, which is under the influence of physical, chemical, and other factors. Using biomonitoring allows an adequate approach to assess the state of biological and ecological systems at the present stage of development.

Biological systems, organisms, populations have insufficient adaptation to anthropogenic stressors. The emergence of new anthropogenic stressors leads to the fact that the system does not have time to activate adaptation processes. Most man-made environmental factors become dangerous for the living, which is very different in intensity, magnitude, duration, and time effects from the existing norm in nature, which are adapted to the biological system. Also living beings are affected not only by one stressor in the city, but a complex balance of factors.

The report by Revich "the "hot spots" of chemical pollution and health of the population of Russia " for the Public Chamber of the Russian Federation reveals that many areas are recognized as areas of ecological emergency.

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Alcohol's health benefits doubted (Сомнительная польза алкоголя для здоровья)

In the opinion of the investigator, any heart gains from drinking alcohol in moderation. The findings in The Lancet suggest that drinking a glass or two of wine a day may not be such a good idea.

Although past research suggests some heart benefits from alcohol, the New Zealand team says the studies were unreliable.

However, sometimes other health risks definitely outweigh the benefits. Rod Jackson, from the University of Auckland is of the opin-

ion that any coronary protection from light to moderate drinking will be very small and unlikely to outweigh the harms.

While moderate to heavy drinking is probably coronaryprotective, any benefit will be overwhelmed by the known harms.

If so, the public health message is clear. There is no data that show the health benefits of alcohol.

Various studies published in the 1970s and 1980s suggested alcohol, in moderation, could be good for the heart."

These early observations were confirmed by the results of previous studies, which suggested a 20% to 25% reduction in heart disease risk linked to light drinking.

But Dr Jackson's team said that the way the studies were carried out did not allow the researchers to be able to say with certainty that the results could be due to the amount of alcohol consumed and not to other factors.

Belinda Linden of the British Heart Foundation suppose that no evidence to suggest that light to moderate alcohol consumption will actually harm the heart. Belinda Linden, head of medical information at the British Heart Foundation said that this suggested that light to moderate alcohol consumption might only give a small amount of protection against coronary heart disease, while the benefits of moderate to heavy drinking are likely to be outweighed by the overall harm that alcohol can also cause.

The good news is that people can still enjoy alcohol in moderation, especially during the festive period.

There is no evidence to suggest that light to moderate alcohol consumption will actually harm the heart. However over indulging can have an adverse effect on health.

People should not be encouraged to start drinking specifically to protect their heart as there are much safer options.

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Animal Magic (Магия животных)

Animal magic is a kind of treatment designed to stimulate people who are withdrawn or uncommunicative has recently been given a new name: pet therapy. It has given difficult children, lonely old people and even anti-social prisoners a completely new outlook on life.

Even though pet therapy is only now being widely used, it is not a new idea. In the eighteenth century an English doctor, William Tuke, filled the grounds of a hospital for mentally disturbed people with chickens, rabbits and goats. At a time when people were usually punished for strange behaviour rather than helped, this was a radical new approach to treating the mentally disturbed. Tuke's idea was that patients could learn self-control by caring for creatures weaker than themselves.

During the 1970's, scientific interest was rekindled by a study that had originally set out to examine the connection between social conditions and heart disease. Quite by chance, researchers discovered that the survival rate of people who owned a pet was significantly greater than those who didn't.

It was discovered that stroking a cat or dog lowers a human being's blood pressure and reduces anxiety. Just having an animal around you can lower your heart rate. Cats and dogs aren't the only pets that can help you to relax either. A dental school in America has discovered that gazing at fish in a tank helps patients relax before undergoing dental treatment. It was also found that birds can also help people to relax. Parrots improve mood, remove depression, apathy, comfort and relieve depression. Poultry: chickens, geese can also make people happier.

The current trend towards using pets in therapy sessions is based on the work of an American psychologist, Dr Boris Levinson. He was treating a child who was very withdrawn and refused to talk. One day, Dr Levinson took his dog Jingles to the therapy session and, to his surprise, the child began stroking and cuddling the dog. Through more contact with Jingles, the child became increasingly open and approachable and Levinson was able to complete the psychotherapy successfully.

One recent study revealed that there were significantly fewer minor illnesses such as colds, backaches and stomach problems among adults after they had acquired a pet. The researcher do not know, if they became healthier as a result of acquiring their pet, but they certainly perceived themselves to be so.

There is no real explanation however, for why animals can change people in various ways. Elizabeth Ormerod, who is spearheading a campaign to introduce pets into a Scottish prison, has watched the effect of animals on prisoners. The Scottish prisons that have some involvement with animals report fewer disturbances as well as better relationships between staff and prisoners. It this way animals help to dispel tension.

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Genetisch modifizierte Organismen (Генетически модифицированные организмы)

Der genetisch abgeänderte Organismus ist ein Organismus, dessen Genotyp mit Hilfe der Methoden der Gentechnik künstlich geändert war. Diese Bestimmung kann für die Pflanzen, die Tiere und die Mikroorganismen verwendet werden. Die genetischen Veränderungen werden in den wissenschaftlichen oder wirtschaftlichen Zielen in der Regel erzeugt. Die genetische Modifikation unterscheidet sich durch die zielgerichtete Veränderung des Genotyps des Organismus im Unterschied zu dem zufälligen, natürlichen Mutationsprozess.

Eine Hauptart der genetischen Modifikation zurzeit ist die Nutzung der Transgene für die Bildung der Transgenorganismen. Die ersten Transgenpflanzen (die Pflanze des Tabaks mit den eingebauten Genen der Mikroorganismen) waren 1983 mit Hilfe der agrobakteriellen Transformation bekommen; die erfolgreichen Feldtests der Transgenpflanzen wurden 1986 durchgeführt, die Pflanzen waren zur Virusinfektion des Tabaks standfest. Dann waren der Tabak und die Sonnenblume, später noch das erste bedeutsame Eiweiß - das menschliche Hormon des Wachstums bekommen.

Vor kurzem haben die Gelehrten das Gen gewählt, das für das Stachelgift des Skorpions antwortet, und haben die Experimente mit dem Weißkohl begonnen. Wozu brauchen sie den giftigen Kohl? Um die Ausnutzung der Pestizide und dabei die Anzahl der Raupen zu verringern, ohne Ernte zu beschädigen. Es wird durch genetisch modifizierte Pflanze das Gift erzeugt, das den Raupen nach dem Biss der Blätter tötet, aber das Toxin ist für den Menschen unschädlich. Noch eine interessante Idee: die grünen leuchtenden Ferkel - die Transgenschweine, die von der Gruppe der Forscher der Nationalen Universität Taiwans aufgezüchtet wurden. Das Hauptziel der Aufzucht solcher Schweine, nach den Erklärungen der Forscher, ist die Möglichkeit der visuellen Beobachtung der Stoffentwicklung bei der Transplantation der Stammzellen. Es ist auch anderer Aspekt der Arbeiten nicht weniger interessant - es sind die Transgenpflanzen mit den geänderten dekorativen Eigenschaften bekommen. Eines der Beispiele ist Erhalten der Pflanzen der Petunie mit den verschiedenen Farben. Der Reihe nach sind die blauen Rosen mit dem Gen, das die Synthese des blauen Pigmentes kontrolliert.

Letzte 50 Jahren haben die Wissenschaftler die Möglichkeit die Errungenschaften der genetischen und molekularen Biologie zur Bildung und der kommerziellen Nutzung von genetisch modifizierten Organismen auszunutzen, die über die neuen Eigenschaften verfügen. Einige GVO können den bedeutenden positiven Einfluss auf die Produktion der Lebensmittel, die pharmakologischen Präparate, den wertvollen Rohstoff für die Industrie ausüben.

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ГУМАНИТАРНЫЕ НАУКИ (ФИЛОСОФИЯ, ФИЛОЛОГИЯ, КУЛЬТУРОЛОГИЯ)

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La langue française comme l'instruments de communication international

(Французский язык как средство международного общения)

L'influence d'une langue est déterminée non seulement par le nombre de personnes pour qui elle est une langue maternelle, mais le nombre de personnes de nationalités différentes qui l'utilisent comme un moyen de communication au public dans le domaine de la science, de la production, de la communications internationales.

Langue Français dans l'Europe médiévale a reçu les fonctions de la langue de communication internationale. On peut éxpliquer cela par le rôle et la puissance exceptionnelle de la France entre autres États féodaux. À cette époque, la France était le plus grand état d'Europe: la majorité de la population de l'Europe a vécu en France. Il y les fats que dès leXIII siècle le français jouait un rôle important dans la communication internationale après la langue latine.

Dans le cadre de renforcement du rôle politique de la France, le français s'agrandit dans toute l'Europe. Dans les XVII et XVII siècles la langue française devient une langue internationale pour l'aristocratie et pour le monde scientifique. En 1783 l'Académie de Berlin a annoncé le concours des dessins sur le thème de l'universalité de la langue française. Mais il faut dire que a réalisation de la fonction de la langue de communication internationale le français effectuait au prix d'un appauvrissement de sa structure. Dans toute l'Europe, de Londres à Saint-Pétersbourg on parlait le même français. C'était la langue avec un vocabulaire relativement limité, sans diversité des styles et des registres.

Ainsi que le russe, l'anglais, l'espagnol, le français appartient à quatre langues internationales avec le nombre d'organisations et de

conférences, où il est utilisé, il se classe deuxième, après l'anglais. Le français est la langue officielle et la langue de travail de l'ONU, de l'UNESCO et beaucoup d'autrs organisations. La valeur de la langue française dans le monde moderne est grande. La littérature française jusqu'à nos jours, reste la plus lue dans le monde entier. Le peuple français a apporté une contribution énorme à la culture populaire. 10 % sur tous les livres sont traduits de la langue française.

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Latin and Greek in English medical terminology (Латинский и греческий в английской медицинской терминологии)

Medical terminology has some characteristic features: it contains a lot of terms with Latin and Greek origin. Affixal synonymy is observed in a great variety of medical terminology. One of the characteristic features of medical terminological is complete doublication of Greek and Latin prefixes. For example, "intradentaire" and "endodentaire"; "supersalivation" and "hypersalivation"; "abscess" and "empyema". We can also find doublication among the definition of the same process: such terms as "stomach" and "abdomen" mean the same phenomenon; greek words – hepar, oesophagus, larynx, pharynx, urethra, thorax, ureter, encephalon; latin words - appendix, tonsilla.

The most numerous group of synonyms among Greek and Latin prefixes is the group of spatial prefixes with locative meaning:

Greek	Latin	Example
Ante-, pre-	pro-	antenatal, presurgical -
prognathic		
Extra-	exo-	extracranial – exocytosis
Infra-, sub-	hypo-	infracostal, sublingual - hypo-
dermic		
Inter-	dia-	interauricular – diathermy
Intra-	endo-	intracardiac – endocrine

Juxtaparajuxtataposition – paramnesia The second subgroup is the group of term elements which have directory meaning. This subset includes such prefixes as... Greek Latin Example absorption - apocleisis Ab-. deapo-Disdisplacement - diagnostic diapermeation - diagnosis Per-, transdia-The third subgroup represent prefixes combine location and directory meaning: Greek Latin Example predisposition – prognosis Ante-, prepro-

Post- meta- postganglionic – metagrippal

During the course of study at the medical university students get acquainted with terms of Latin origin and plural forms, e.g.:

- cilium cilia
- bacterium bacteria

atrium - atria

Linguists have noted that words of Latin origin are predominantly used to denote anatomical terms while Greek words are used in clinical terminology.

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L'impact de la langue française à la diplomatie mondiale (Влияние французского языка на мировую дипломатию)

La France a fait la plus grande contribution à la formation de l'étiquette diplomatique et des relations internationales.

La diplomatie française a une longue et fascinante histoire. Le premier homme d'état, qui a déclaré que la diplomatie est un processus qui prévoit permanente négociation a été le cardinal de Richelieu. Et au début du XXII-ème siècle, il réalisait l'importance de l'opinion publique pour le succès de la diplomatie et orientait des diplomates français à la mention de l'opinion publique.

Les XXIII et XIX siècles ont été le temps de la floraison de la diplomatie française. Après la Seconde Guerre Mondiale, elle perdait son importance politique, économique et culturelle de l'influence au monde et le français, qui était la langue de la diplomatie, a cédé sa place à l'anglais. Mais dans les années 80-s du XX siècle le ministère des Affaires étrangères de la France le cardinal de Richelieu renforcait la participation des jeunes diplomates dans le domaine des relations économiques.

Dans le cadre de cet article nous examinons l'influence de la langue française sur le monde de la diplomatie. Alors la diplomatie est l'art de résoudre les difficultés internationalles par des moyens pacifiques. Et la théorie de la «négociation permanente» développée par le cardinal de Richelieu est devenue la base de la diplomatie modern. On peut dire que cet homme d'État français a fait une contribution significative à la théorie et la pratique de la diplomatie, il est venu à la conclusion que la diplomatie doit faire l'objet d'une activité constante. Accumulé l'expérience de la diplomatie française a constitué la base pour le travail de fond écrit par l'ambassadeur français François Kaleri XVIe siècle. Avec l'avènement de ce livre la diplomatie a été vu comme une science et un art.

Les raisons dont une langue devient internationale sont premièrement, le pouvoir politiques des peuples qui utilisent cette langue et leur supériorité militaire. Et au XVIIIe siècle, la langue française était encore plus répandue après l'influence de Napoléon. Jusqu'à le Moyen Age, le latin était considéré comme la langue internationale. Mais depuis la signature du Traité de paix Aachen en 1748, qui a été écrit en français, cette langue a été souvent utilisée dans les accords d'autres pays.

Par conséquent, aujourd'hui il y a des emprunts utilisés en termes diplomatiques russes tels que: l'attaché, la clientèle, le prestige et bien d'autres clichés. A présent l'anglais est considéré comme la langue de négociation, mais l'influence de la langue française est très grande.

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L'influence des formes de communication de la jeunesse sur la langue française moderne (Влияние форм молодежного общения на состояние современного французского языка)

La linguistique examine la langue «comme la source de la réalisation de la communication, qui après avoir actualisée, forme l'ambiance linguistique». L'actualisation se réalise par le parlant, par qui on réclame les possibilités de la ressource donnée. La jeunesse française utilise activement les ressources de la langue, en utilisant les intentions communicatives personnelles dans le format des élaborations les plus récentes techniques pour les relations verbales et non verbales, tels que ICQ, Skype, les chats, les blogs, les réseaux sociaux, les SMS et les autres.

De nos jours dans la langue française le rôle de l'argot a augmenté considérablement, de quoi témoignent les recherches des savants russes et français. Le contenu du terme «l'argot» a changé considérablement. À l'avis de V.V.Khimika, les argotismes modernes sont des unités avec la stabilité relative et l'usage massif, ayant la tendance à l'élargissement de la sphère de l'utilisation et le passage au langage populaire massif. Dans le vocabulaire de chaque Français moderne il y a des argotismes, puisqu'ils simplifient considérablement la compréhension de quelques phénomènes et augmentent la vitesse de l'étude de n'importe quel information. Il n'y a pas longtemps le terme "l'argot" désignait la langue des groupes fermés des gens, à présent le terme donné peut caractériser les particularités de la langue de certaines couches de la société, par exemple, la jeunesse. Les procès de formation des mots dans la langue des immigrants stimulent le développement du système aux plusieurs niveaux de l'argot français, y compris de ieunesse.

L'influence sur la langue française donne l'informatisation globale. «La langue SMS», ou «texto» a élargi ces dernières années

considérablement la sphère du fonctionnement. L'économie du temps et des finances, ainsi que la quantité limitée de symboles sur l'écran de

l'appareil communicatif amènent à la compression forcée de l'information et le texte par la réduction des mots, l'utilisation des rébus graphiques (le réarrangement des symboles), les formations du nouveau vocabulaire qui devient la partie typique de la vie de la jeunesse française.

La langue française change vite aujourd'hui, si l'on veut l'étudier il est nécessaire de s'appuyer sur le vocabulaire des jeunes français aussi. L'évolution rapide de la langue oblige les linguistes de chercher les nouvelles voies pour l'étudier, qui seront plus parfaites, effectives et rapides.

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L'importance internationale de la langue française (Международное значение французского языка)

L'importance mondiale de la langue est déterminée non seulement par le nombre de personnes pour lesquelles la langue est maternelle, mais dans une plus grande mesure par le nombre de personnes d'autres nationalités, qui l'utilisent pour communiquer au public (dans le domaine des sciences, des affaires, du tourisme, des relations internationales).

Si la France peut maintenant proposer sa propre langue comme une langue de la communication internationale, c'est parce qu'elle est passée à travers des siècles d'adoration et de l'utilisation généralisée de sa langue. La langue française a une tradition de son utilisation comme une langue internationale, pendant une période assez longue dans l'histoire des Etats européens.

La langue française au Moyen Age est devenue la langue de la communication internationale grâce au rôle éminent de la France parmi les autres Etats féodaux.

En Italie, en ce temps-là l'influence de la langue française était tellement grande que les écrivains et les savants employaient le français pour créer leurs œuvres.

Dans XVII-XVIII siècles la langue française est devenue la langue internationale de l'aristocratie et du monde scientifique. La création de l'Académie française en 1634 par le cardinal de Richelieu a donné à la langue française une augmentation extraordinaire pendant XVII - XVIII siècles et a déterminé son statut sur la scène internationale. En Angleterre, en Allemagne, en Italie, aux pays nordiques, le français était considéré comme la langue de la civilisation moderne et était largement utilisé, au lieu du latin dans la science et la vie sociale.

En 1896, la langue française a été reconnue comme une langue officielle des Jeux Olympiques.

La langue diplomatique officielle en Europe au XVIII siècle était le latin. Tous les documents diplomatiques étaient faits en latin. Depuis le XVIII siècle, le français a pris la place du latin.

Le français est la langue officielle dans plus de 33 pays.

La langue française est la deuxième langue étudiée comme une langue étrangère.

Le français est l'une des six langues officielles de l'ONU (l'arabe, l'anglais, l'espagnol, le chinois, le russe, le français); tandis que l'anglais et le français sont les langues de la communication professionnelle quotidienne, l'anglais et le français sont les langues du travail du Secrétariat de l'ONU).

Le français est la langue officielle de nombreuses organisations internationales: l'UNESCO, l'Union Européenne, le Fonds monétaire international, le Comité international olympique, la Cour internationale de Justice, la Cour européenne des droits de l'homme, l'Organisation mondiale de la santé.

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La langue française comme un facteur d'influence sur les anciennes colonies françaises (Французский язык как фактор влияния на бывшие французские колонии)

Au temps jadis le soleil ne s'est jamais couché sur les territoires français, presque comme sur l'Empire britannique à l'heure de son gloire. Par exemple, au continent africain, plus d'une douzaine de pays se sont réveillés et se sont endormis sous la Marseillaise. Il y a un demisiècle, ils ont tous gagné l'indépendance. Cependant, ils n'ont pas perdu le contact avec l'ancienne métropole, et il y a une explication complètement logique de cela.

Paris a repu les structures administratives de ses territoires des centaines de milliers de français. C'est grâce à eux qu'il y avait un processus d'acculturation des populations locales par la riche civilisation française et sa langue. Ce «facteur humain» a joué un rôle décisif à cet égard. C'est Charles de Gaulle, qui à la fin des années 50 a lancé l'idée de l'Union française, comportante une relation privilégiée avec ses anciennes colonies dans presque tous les domaines, y compris la politique, la culture et, bien sûr, l'économie.

Le moyen le plus important du renforcement de l'influence française est l'éducation. Comme autrefois, pour les jeunes africains et surtout de ses anciennes colonies la France reste une priorité des pays européens où ils peuvent obtenir l'enseignement supérieur, ainsi que l'éducation spécialisée.

Chaque année, les universités de Paris, Lyon, Marseille et autres villes inscrivent environ cent mille africains. Après leur retour, ils conservent de bons souvenirs du pays, qui a donné des connaissances et donc la possibilité de prendre une place décente dans la société. Qu'est-ce qui les attire en France? Bien sûr, des liens historiques avec la métropole, la langue, ainsi que des diasporas nationales.

Un autre pont, qui relie Paris aux anciennes colonies est l'existence de nombreuses diasporas, qui sont constamment en liaison avec «la patrie historique». L'image sera incomplète, si on ne mentionne pas la Francophonie. Le terme a été inventé en 1880 par le géographe français Onézim Reclus. Le terme désigne l'ensemble de personnes et de pays qui parlent la langue française. Dans toutes ses anciennes colonies, la langue française reste toujours la langue des élites politiques, intellectuels, qui ont été instruits en France métropolitaine.

Pour utiliser la ressource linguistique l'Organisation internationale de la Francophonie a été créée, qui réunit près de 60 pays dans le monde entier, y compris toutes les anciennes colonies de la France à l'exception de l'Algérie.

La Francophonie ne doit pas seulement s'occuper de la diffusion du Français, mais aussi former un favorable espace politique, économique et culturel autour du pays d'où il est originaire. Donc on pense à Paris que c'est très utile et on n'économise pas des moyens de financement sur ce «agent de liaison».

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Ethical aspect of admissibility of wearing female Muslim clothes in a modern higher educational establishment (Этический аспект приемлемости ношения женской мусульманской одежды в современном вузе)

The results of the study related to the problem of admissibility of wearing a headscarf, khidzhab, paranzha by female students of the higher educational establishment are presented in the paper. At present this problem is considered to be topical due to the growing number of female students wearing headscarves and khidzhabs during the academic studies.

The aim of study was to reveal the attitude of the students of our university to the fact of wearing clothes conforming Islam requirements by Muslim females during the course of studies. For this purpose we used social questionnaire as a method of scientific research. We have complied a special questionnaire that allowed us to obtain/answers to the following questions:

1. what religion the student adhere to;

2. whether he/she knows the purpose of wearing a head-scarf/khidzhab/paranzha;

3. what feelings a Muslim female wearing such clothes evokes in him/her;

4. what is the attitude to the fact of having such a Muslim female in his/her group.

We questioned 100 students. Most of them (52%) were Muslims; Christians were 21%; believers who did not belong to any definite kind of confession made up 17%; Atheists made up 6%; Agnostics -2%; Heathens -1%; Nihilists -1%. Students with negative attitude to the fact of having such a Muslims female wearing a headscarf as a groupmate made up 5%. The number of the students with negative attitude to the custom of having such a Muslim female wearing a khidzab or paranzha as a group-mate made up 10%. On the basis of the obtained results we assume that the habit of wearing a headscarf would not interfere with the process of acquiring knowledge except some cases when the size and construction of it would violate the regulations of accident prevention and could a be dangerous for life and health for a person wearing such a headscarf or for some other people. As for the fact of wearing paranzha that closes most of the face leaving only slit holes for the eyes that considerably complicates the process of communication during the educational process it was found out that this would interfere with the process of acquiring knowledge and its adequate assessment. Therefore the fact of wearing paranzha in an educational institution could hardly be justified. Besides it is important to take into account the teachers' and students' points of view when taking decisions regulating admissibility of wearing religious clothes in a secular educational institution.

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L'influence du français sur la langue russe dans les XVII - XIX siècles

(Влияние французского языка на русский язык в XVII – XIX веках)

Une grande partie du vocabulaire russe constitue les emprunts de la langue française.

Quand Pierre le Grand a commencé à introduire en Russie les réalisations de la culture occidentale, le délaminage entre la noblesse et le reste du people a reçu l'élément de langage. Dans les XVIII-XIX siècles la noblesse russe parlait français même à la maison, et finalement beaucoup de nobles possédaient déjà mal la langue russe. La connaissance de la langue française était obligatoire pour l'éducation classique de cette époque.

La tendance d'avoir des livres en français, des vêtements français, des meubles et d'autres choses est devenue très populaire. Au XVIIIe siècle, la langue française deviennent presque internationale.

Pendant le règne de Catherine la Grande la connaissance du français était la condition indispensable de l'enseignement laïque, une sorte de marque de personnes appartenant à la noblesse, la «clé» pour ouvrir la porte au beau monde. En conséquence, à la fin du XVIII siècle la haute société de Saint-Pétersbourg maîtrisait la langue de Voltaire et de Diderot, mieux que le russe.

La fin du XVIII siècle a été l'apogée des gouvernants de la France. On traduit «le tuteurs» du français comme «éducateur des enfants». Beaucoup de nobles ont commencé à inviter les éducateurs d'Europe pour ses enfants. La plupart des tuteurs occidentaux étaient très instruits, et nobles de naissance. C'était une profession masculine. Avoir un tuteur dans la maison a été considéré comme très prestigieux.

Après avoir analysé la littérature: les encyclopédies, les magazines de mode, les affiches, nous sommes venus à la conclusionque les principaux domaines de la pénétration de la langue française sont suivantes: la politique, l'économie, le lexique militaire, le théâtre, l'art, la musique, les vêtements et les accessoires, la mode, la

cuisine et les articles ménagers. Selon les statistiques la langue russe compte environ 1200 mots d'origine française. Ainsi, nous pouvons conclure que la langue et la culture françaises ont eu une grande influence sur la Russie dans le XVII - XIX siècles.

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L'étude de la langue comme le moyen du développement de l'intelligence

(Изучение языка как средство развития интеллекта)

«Celui qui ne connaît pas les langues étrangères ne connaît rien de sa propre langue.» de Johann Wolfgang von Goethe

A présent le rôle et la signification de l'éducation des spécialistes de mentalité non standarde, avec les capacités communicatives dans de diverses branches d'activité rudement augmente. Aujourd'hui un bon spécialiste, ce n'est pas celui qui applique correctement les connaissances reçues à l'université, mais c'est aussi une personne qui peut indépendamment penser sur la langue étrangère ainsi que sur la langue maternelle.

L'étude de la langue étrangère est un des meilleurs outils accessibles pour la croissance personnelle et l'autodéveloppement, aidant à développer les facultés mentales, la mentalité analytique, le potentiel créateur et la flexibilité de l'esprit. Les savants affirment que l'étude de la langue étrangère développe le savoir-faire d'établir les liens logiques et créer les cartes d'esprit.

L'étude passée dans l'État du Massachusetts en 2007, a montré que les étudiants qui étudient la langue étrangère, développent la clarté plus exprimée et la netteté de la mentalité, en comparaison d'autres contemporains. Le groupe des étudiants qui étudiaient la langue étrangère pendant deux ans, a reçu les plus hautes notes selon les résultats du test, que leurs condisciples de même année qui connaissaient seulement la langue maternelle. La langue définit la façon que nous regardons le monde et comme nous le percevons. Selon l'hypothèse de Sepire (l'hypothèse de la relativité linguistique), qu'aujourd'hui examinent activement dans la science, la langue influence sur notre mentalité et sur le procès de la connaissance. C'est pourquoi quand la personne connaît plus qu'une langue, il a quelques images linguistiques du monde.

En train de l'étude de la langue étrangère l'élève fait inévitablement la parallèle avec la langue maternelle, il fait les associations intellectuelles et les comparaisons. C'est pourquoi l'étude de la langue étrangère provoque une bonne compréhension de la langue maternelle et l'utilisation plus effective de ses ressources. L'étude de la langue étrangère augmente le potentiel créateur, en obligeant de paraphraser, trouver les synonymes et utiliser toute la variété des moyens de parole.

La conaissance de la deuxième ou troisième langue fait manifestement l'image linguistique du monde plus riche dans les descriptions de, comment on lié les objets et les phénomènes. Ainsi, chaque objet reçoit plus «d'accrocs» pour la mémorisation et l'extrait ultérieur de la mémoire. La mémoire devient plus solide, large et plus associative. La dernière qualité est particulièrement importante, puisque notamment les associations sont la base de l'oeuvre.

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Anglicisms in Russian Language (Англицизмы в русском языке)

If you hate memorizing Russian words, then this article will make your day! Today we will talk about Anglicisms – words that came into Russian language from English. All languages change constantly. They evolve and grow. They adopt words from other languages, recycling them and creating new meanings, while at the same time losing old unused words on their way. It's funny how we notice that we talk slightly different from older generations and younger generations talk slightly different from us.

Languages change due to the variety of many different reasons. One of the reasons is adopting words from other languages. Russian has adopted many words from English language. These words are called Anglicisms – **англицизмы** [an-glee-TSIZ-mi]. Due to the cultural, industrial and economic development, growth of tourism and emergence of the Internet, Anglicisms have become and are still becoming increasingly popular in Russian language within the last two decade.There are several reasons that make English words feel more welcome in Russian. Let's talk about some of them.

Reason 1: It Seems Easier to Use Anglicisms Sometimes when having a conversation in Russian, it's difficult to find an appropriate word in English. This is true about Russians who speak English often, for example, when living in an English-speaking country. It's not that we don't have similar terms in Russian, we do. Sometimes we just find it easier to use English words written in Cyrillic.

Another interesting phenomenon is translating sentences or phrases from English into Russian and forming them into phrases or sentences in Russian the same way they are in English. This makes them sound strange and awkward.

If you would like to speak Russian clearly with minimal use of the expressions similar to the ones above, you can try to work on your vocabulary. Read in Russian as much as possible and practice by speaking to a native Russian language speaker.

Reason 2: Anglicisms for New Inventions Some Anglicisms have immigrated into Russian because they express a new term that had never been used in Russian before. At least, these guys have a good excuse for being a part of Russian language. This is especially true for new inventions, for example: Сканер = scanner, Принтер = printer, Компьютер = computer

Reason 3: Anglicisms It's true that sometimes we would use an Anglicism to make things sound pretty in Russian. Using English words may seem a little more accurate, appealing or even prestige then using the same words in Russian, for example, имидж (image) instead of образ, шоу (show) instead of представление.

There are many more interesting Anglicisms that I will talk to you about. In my next article, I will cover computer – related vocabulary

and slang. What do you think about Anglicisms in Russian language? Do you find it easier to learn them?

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L'argot moderne des jeunes gens comme un moyen de communication (Современный молодежный сленг как средство общения)

L'argot des jeunes est une sous-langue spéciale comme une partie de la langue nationale qui est utilisée par les personnes de 14 à 25 ans en communication facile avec leurs homologues.

Le vocabulaire des jeunes est le système le plus ouvert dans la langue française moderne, où le vocabulaire est constamment renouvelé par non seulement à cause des emprunts età cause d'élargissement du sens des mots communs, mais aussi en raison d'autres processus qui aident au processus de la formation des mots. L'argot des jeunes en français se pose souvent comme une protestation contre les clichés, ou le désir d'exceller, de regarder d'origine, ce que caractérise des jeunes. Les adolescents en utilisant l'argot des jeunes, cherchent à exprimer leur attitude critique ou ironique au monde des adultes pour se sentir plus indépendant et pour gagner la popularité parmi leurs pairs.

Ainsi, l'argot des jeunes peut être appelé crypté ou la langue «secrète»parce que ces mots se distinguent des normes généralement acceptées de la parole dans de nombreux paramètres linguistiques.Les jeunes utilisent dans leur propre langue des mots étrangers, les professionnalismes, des mots vulgaire, les réduction, les métaphores, étc. Voici quelques exemples: piger – comprendre (понимать), le boucan – le bruit (шум), le pote – le copain (приятель), le bi-bop, le portable, le mobile – le téléphone de poche (сотовыйтелефон), le bahut – le lycée (лицей), la meuf – la femme (женщина), le trac – la peur (страх) étc.

«Le langage de la rue» assimile dans la langue française.Les films, la radio et la télévision, pour les adolescents et les jeunes, les jeux informatiques contribuent à sa assimilation. Ainsi, l'étude de l'argot des jeunes dans d'autres pays peut contribuer à faciliter la communication et d'améliorer la compréhension mutuelle.

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МАТЕМАТИЧЕСКИЕ НАУКИ

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The History of the C Language (История языка Си)

The C programming language was devised in the early 1970s by Dennis M. Ritchie, an employee from Bell Labs.

In the 1960s Ritchie worked, with several other employees of Bell Labs, on a project called Multics. The goal of the project was to develop an operating system for a large computer that could be used by a thousand users. In 1969 Bell Labs withdrew from the project, because the project could not produce an economically useful system.

Ken Thompson a Bell Labs employee began to work on the development of a new file system. He wrote a version of the new file system for the DEC PDP-7, in assembler. Soon they began to make improvements and add expansions. After a while a complete system was born. Brian W. Kernighan called the system UNIX. The whole system was still written in assembly code.

Besides assembler and Fortran, UNIX also had an interpreter for the programming language B. The language B was developed in 1969-70 by Ken Thompson. In the early days computer code was written in assembly code. To perform a specific task, you had to write many pages of code. A high-level language like B made it possible to write the same task in just a few lines of code. The language B was used for further development of the UNIX system. Because of the high-level of the B language, code could be produced much faster, then in assembly. A drawback of the B language was that it did not know datatypes and using of "structs". (Everything was expressed in machine words) The lag of these things formed the reason for Dennis M. Ritchie to develop the programming language C. So in 1971-1973 Dennis M. Ritchie turned the B language into the C language, keeping most of the language B syntax while adding data-types and many other changes. The C language had a powerful mix of high-level functionality and the detailed features required to program an operating system. Therefore many of the UNIX components were eventually rewritten in C.

The programming language C was written down, by Kernighan and Ritchie, in a now classic book called "The C Programming Language, 1st edition". (Kernighan is the author of the famous "Hello, World" program and many other UNIX programs).

For years the book "The C Programming Language, 1st edition" was the standard on the language C. In 1983 a committee was formed by the American National Standards Institute (ANSI) to develop a modern definition for the programming language C. In 1988 they delivered the final standard definition ANSI C that was based on the book from K&R 1st edition.

The C language is one of the most widely deployed languages today. Windows and UNIX OSes are written mostly in it and its descendants such as C++, C#, PHP, Python, Ruby, Perl and others.

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Mathematical paradoxes (Математические парадоксы)

Paradox is a strange, dispersing from the standard opinion, and also an opinion contradicting (sometimes only at first sight) to common sense. You can very often meet paradoxes. Striking example of a paradoxical conclusion is Alice's reflection from Lewis Carrol's fairy tale:

"The more cheese you have: the more holes there are in it. But, the more holes you have: the less cheese there is. It turns out that the more cheese there is the less cheese there is?" And, of course, paradoxes are met in mathematics. Mathematical paradox is the statement, which can be proved both as true and as false.

One of the most popular paradoxes of the theory of sets is Russell's paradox. Here is one definition:

Let K be a set of all sets which doesn't contain themselves as elements. Tell if K contains itself as an element? We will try to prove the statement as true or false. We will assume that the statement is true. Then, by definition, it can't be an element of K. We will receive a contradiction. Now we will assume that the statement is false. By definition, it has to be an element of K and again there is a contradiction.

In logical literature we can meet "Burali-Forti's paradox" (paradox of the greatest serial number. We will assume that x is any set of serial numbers. It follows from this that the set sum $\bigcup x$ is a serial number which is more than each of x elements or is equal to it.

Let's say that Ω is a set of all serial numbers. Then it is fair that $\bigcup \Omega$ is a serial number, bigger or equal to any of numbers of Ω . But $\bigcup \Omega \cup \{\bigcup \Omega\} = \bigcup \Omega + 1$ is a serial number, which is already strictly bigger, and not equal to any of numbers of Ω . But it contradicts the condition in which Ω is a set of all serial numbers.

And there is a lot more of such paradoxes in the Cantor theory therefore it is often called the "naive" theory of sets.

The intuitive Cantor theory of sets is considered to be a contradictory theory among mathematicians. In justification of such assessment it is usually specified that it is indistinct, "not enough mathematical". But very few people can explain what the above-mentioned paradoxes consist of.

We don't know other bases to consider the "naive" theory contradictory.

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Computer Graphics (Компьютерная графика)

Computer Graphics is the technology with which pictures in the general sense are generated or managed, displayed, and processed in an application-oriented manner by means of computers, and with which pictures are also correlated with non-graphical application data. The term computer graphics also implies the computer-aided integration and handling of these pictures synchronized with other data types.

Today computer graphics is already the basic technology for visualization and implementing interactive graphics dialogues for design and engineering applications (CAD, CAE, CAM, CIM, etc.), for printing, publishing, and office applications, or media and visual communication, for geographical information ,systems (GIS), and for architecture or civil engineering applications.

There are two kinds of computer graphics — raster (composed of pixels) and vector (composed of paths). Raster images are more commonly called bitmap images.

A bitmap image uses a grid of individual pixels where each pixel can be a different color or shade. Bitmaps are composed of pixels.

Vector graphics use mathematical relationships between points and the paths connecting them to describe an image. Vector graphics are composed of paths.

The image to the left below is representative of a bitmap and the image to the right is representative of a vector graphic. They are shown at four times actual size to exaggerate the fact that the edges of a bitmap become jagged as it is scaled up:

Computer graphics are any types of images created using any kind of computer. There is a vast amount of types of images a computer can create. Also, there are just as many ways of creating those images. Images created by computers can be very simple, such as lines and circles, or extremely complex such as fractals and complicated rendered animations.

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What is mathematical modeling? (Что такое математическое моделирование?)

While there is no consensus yet as to a precise definition of this term, mathematical modeling is generally understood as the process of applying mathematics to a real world problem with a view of understanding the latter.

A mathematical model is a description of a system using mathematical concepts and language. The process of developing a mathematical model is termed mathematical modeling. Mathematical models are used in the natural sciences (such as physics, biology, earth science, meteorology) and engineering disciplines (such as computer science, artificial intelligence), as well as in the social sciences (such as economics, psychology, sociology, political science). Physicists, engineers, statisticians, operations research analysts, and economists use mathematical models most extensively. A model may help to explain a system and to study the effects of different components, and to make predictions about behaviour. The modeling process may or may not result to solving the problem entirely but it will shed light to the situation under investigation.

Mathematical modeling approaches can be categorized into four broad approaches: Empirical models, simulation models, deterministic models, and stochastic models. The first three models can very much be integrated in teaching high school mathematics.

Empirical modeling involves examining data related to the problem with a view of formulating or constructing a mathematical relationship between the variables in the problem using the available data.

Simulation modeling involve the use of a computer program or some technological tool to generate a scenario based on a set of rules. These rules arise from an interpretation of how a certain process is supposed to evolve or progress. Deterministic modeling in general involve the use of equation or set of equations to model or predict the outcome of an event or the value of a quantity.

Stochastic modeling takes deterministic modeling one further step. In stochastic models, randomness and probabilities of events happening are taken into account when the equations are formulated. The reason behind this is the fact that events take place with some probability rather than with certainty. This kind of modeling is very popular in business and marketing.

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The history of the computer appearance (История возникновения ПК)

The word "computer" comes to us from the distant eighteenth century. For the first time it is found in the Oxford Dictionary. Initially, the concept of the computer, interpreted as a calculator. This is the translation of the word from the English language. It is different from today that could be applied perfectly to any computing device.

The first computers and calculators were mechanical devices and knew how to perform basic mathematical operations such as addition and subtraction. In 1653, there was the first computer capable to solve more complex problems, and more specifically, to divide and multiply.

For some time, the improvement of computers emphasized on the perfection of mechanisms and reducing the size. Computers are also carried out four basic arithmetic operations, but became lighter and compact.

In 1822, the device was first able to solve simple equations. It was the greatest breakthrough in the development of computer technology. After approval of the project by the government, it has been allocated, and the invention has been able to further development. Soon, the car gained steam propulsion and became fully automatic. After another

decade of continuous research, there was a first analytical model - multi-purpose computer, able to handle a lot of numbers, working memory, and programmed using punch cards.

In the 1946 year, the first computer appeared. Its weight, size and power consumption of energy, for our understanding, were simply shocking. Suffice it to mention the weight of 30 tons, to imagine the magnitude of this machine, but at the time it was a great achievement.

And at one point, the scientists were able to integrate into a single chip multiple semiconductor devices. This point was a new impetus in the development of computer technology. The computer appeared disc drive, hard drive, mouse and graphical interface. Its size is reduced so that the car can be put on the table. This was the birth of the personal computer, the prototype of which is known to us today.

After creating the first commercial personal computer version, the main focus in the development of computer technology, was aimed at improving quality and productivity of devices. Gradually progress led the computer to what we see today. The devices became more powerful and more compact: notebooks, netbooks, tablet PCs, etc.

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The biggest numbers in the Universe (Самые большие числа во вселенной)

There are numbers so enormously and impossibly vast that to even write them down would require the entire universe. But some of these incomprehensibly huge numbers are crucial for understanding the world.

When I say "the biggest number in the universe", what I really mean is the biggest *meaningful* number, the largest possible number that is useful in some way. There are lots of contenders for this title, but there is a very real risk that trying to understand "the biggest numbers" will blow your mind. Googol and Googolplex. We might as well begin with what are quite probably the two largest numbers you've ever heard of, and are in fact the two largest numbers with commonly accepted definitions in the English language. The googol, which has since become world famous (albeit misspelled) in the form of Google, began life in 1920 as a way to get children interested in large numbers. To that end, American mathematician Edward Kasner took his two nephews on a walk through the New Jersey Palisades. He asked them for any ideas they might have, and the nine-year-old Milton proposed the word "googol." Where he got this particular word is unknown, but Kasner decided that 10^{100} – or, the number one followed by a hundred zeroes – would henceforth be known as a googol.

But voung Milton wasn't finished - he also proposed an even larger number, the googolplex. This number, according to Milton, was 1 followed by as many zeroes as you could write before you got tired. Though a charming idea, Kasner decided a more technical definition was needed. As he explained in his 1940 book Mathematics and the Imagination, Milton's definition left open the dicey possibility that a random buffoon could become a greater mathematician than Albert Einstein simply by possessing greater endurance. So, Kasner decided a googolplex would be 10^ogoogol, or 1 followed by a googol of zeroes. To put that another way - and in similar notation to how we'll be dealing with various other numbers we'll be talking about – a googolplex is 10¹⁰10¹⁰. To put that in some mind bending perspective, Carl Sagan (an American astronomer, cosmologist, astrophysicist) once pointed out that it would physically impossible to write down all the zeroes in a googolplex, because there isn't enough room in the universe. If you filled the entire volume of the observable universe with fine dust particles roughly 1.5 micrometers in size, then the number of different combinations in which you could arrange and number these particles would be about one googolplex.

Linguistically speaking, googol and googolplex are probably the two biggest meaningful numbers (at least in English), but as we're about to find out, there's no end of ways to define "meaningful".

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ФИЗИЧЕСКИЕ НАУКИ

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Laying fiber optic cable through water obstacles (Прокладка оптического кабеля через водные преграды)

Methods of laying underwater river fiber optic cable (OC) depend on the nature of the reservoir, its width, depth, presence of navigation, time pad, mass of a cable and available technical means of gaskets. The cable can be laid on bridges or in the body of water by means of a cable layer or watercrafts (a barge, a boat, a raft, a launch, etc.)

The route of cable transition is located if possible on the straight sections of the river with non-washable course, low coast, not subjected to coast destruction, with the smallest width of a flood plain. To protect the cable from ice jams, transition through the navigable and floatable rivers, is usually placed lower (on a watercourse), the main automobile and railway bridges.

Before starting work, it's necessary to carry out an arrangement of a line track. Routes of underwater transition are designated by reference points. In case of need, diving examination of the route of cable transition is conducted before laying the cable. To protect it against damages coursed by anchors of the river means of transport, or by moving masses of ice during river icebreaker, or by sinkers, stones, or coursed while cleaning and deepening the reservoirs, etc. cables are buried in a bottom.

OC on the eroding banks having a bias more than 30 $^{\circ}$, on rises or descents is laid manually in a zigzag fashion (snake-like) with a deviation from an axis of the direction of laying on 1,5 m on a site 5 m long. On abrupt coast and in rocky soil a conduit is to be cut down. In rocky soil the cable is laid on a sandy pillow with thickness of the top and lower layers by not less than 15 cm.

Experience of the traditional laying of electrical cables of communication through the mountain and floatable rivers shows that the existing technology (the guy-roped transitions device, considerable deepening in a bottom of the river for additional protective measures) is applicable only to the optic cables of high strength structure. Laying OC without metal elements through separate water barriers causes certain difficulties. For example, at small movements of ground soils cable can emerge. At a strong current the cable is under additional loading and it's necessary to control that the level of this loading has not exceeded the admissible. Therefore, the cable is recommended to be laid in the protective conduit buried in a bottom. Polyethylene pipes, and in hazardous areas, steel pipes can be laid (as an underground cable) at a depth up to 1.2 m.

Laying cables through water barriers, as a rule, is carried out on the bridges. If the approach to the bridge significantly increases the extent of the route or the bridge has adjustable part, then equip underwater transitions. Through the narrow waters cables are laid in pipes or do air and cable transitions.

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Stages of engineering-geodetic survey (Этапы инженерно-геодезических изысканий)

Carrying out engineering-geodetic surveys for construction is necessary for collecting data about an area and data analysis about the relief of a certain district. Also, implementation of this type of work implies obtaining information on already existing buildings, including underground structures. Within the engineering manufacturing practice at "Bashkir grazhdan proekt" civil engineering workshop our task was primarily to carry out a topographic survey of the southern part of Dmitrievka village of Ufa district in the agricultural company "Nikolaevskaya". The aim of the topographic survey was to prepare a topographic plan in the scale of 1:500 of the terrain, existing buildings,
underground structures and determining their specifications. A topographic map is a mandatory part of any development project, which involves a set of measurements and calculations, data analysis, forecasting, marking of the boundaries, etc. At the beginning of a preparatory stage we received the technical project and prepared the contractual documentation. Then we gathered and processed data of past-year engineering surveys of the area, including the results of the carried out land, cartographical, and aerial surveys. Then, a plan of engineering-geodetic works was prepared to meet the requirements of the technical project taking into account hazards related with natural and man-made conditions of the area.

At a field stage a package of field works was performed. It implied the necessary measurements and other activities on preliminary processing of the received figures and the data for maintenance of the control of their quality, completeness and accuracy. To create a set of horizontal and vertical values the reference systems of Bashkir state agrarian university and the state geodetic network were used as bench marks of geodetic control points. Processing of GNSS measurements was done with the help of Topcon Tools software package. Sokkia total station was employed to carry out the survey while RIDGID SR-20 utility locator was used to survey underground structures.

The third stage of the survey was concerned with estimation of accuracy of the received results, information about objects, processing of the field work figures for designing and construction, location of land elements, underground and elevated structures. In addition, we prepared specifications of technical characteristics of objects and natural hazards in the area. For processing of field data we used CREDO DAT software. Topographic maps were updated using CREDO Topoplan and AutoCAD automated processing techniques. Finally, the work was completed with a technical report of the engineering-geodetic survey.

To sum it up, engineering-geodetic surveys are carried out in three stages: preparatory, field and processing of the field data.

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Acousto-optic sensors and materials for their production (Акустооптические датчики и материалы для их производства)

Acousto-optic sensors differ in comparative simplicity of production, possibility of considerable removal of the secondary equipment from the place of measurements, compatibility with fiber-optical systems of collecting and transfer of information signals, universality, multifunctional usage, long service, lack of mechanical contact with the surface under observation, simplicity of service, high reliability, accuracy, high resolution, etc.

At present, development of the devices using acousto- optic sensors, has reached such a stage when their characteristics are limited only by the fundamental parameters of the applied materials, in particular, acoustic attenuation.

The main criterion at the choice of photoelastic medium is the coefficient of acousto-optic quality $M_2 = p^2 n^6 / \rho V^3$, where p – elastic and optical coefficient, n - refraction index, ρ - material density, V - velocity of an acoustic wave propagation. It characterizes efficiency of interaction, regardless of geometry of light and acoustic bunches.

The higher M_2 is, the lower the acoustic power required to obtain the necessary diffraction efficiency. High quality materials typically have big attenuation, whereas materials with a low acoustic attenuation have a relatively low value of the quality factor. Such acousto-optic materials as fused quartz, TeO₂ and LiNbO₃ are widely used. Recently there have been reports on creation of new materials for the infrared range, which will stimulate application of infrared lasers.

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The use of oil refining waste (Использование отходов нефтепереработки)

In the oil refining and petrochemical industry one of the major solid-waste is acid tars. Acid tars are heavy, sticky and resin masses with strongly pronounced acid smell due to significant number of free sulphuric acids content (from 20% to 70% of tars weight). The volumes of acid tars are quite considerable. Their yield across the country is estimated at about 300 thousand tons per year. The extent of this waste use does not exceed 25%, which leads to a very significant concentration of masses in the factory storage ponds (barns). Oil sludge is another kind of wastes. It is solid impurity in the recycled and secondary materials in the factories that lead to formation of that widespread type of waste. Their output is about 7 kg per 1 ton of processed oil, leading to the accumulation of huge masses of these waste products in ground barns of refineries. Such sludges are heavy petroleum residues containing on average 10-56% oil products, 30-85% water and 1,3-46% solids impurities. When storing in sludge storage pits, such wastes are stratified. Top layers contain water emulsion of petroleum products. Middle layers include water contaminated with oil products and suspended particles. Bottom layers contain wet solid mass soaked by oil products.

The most common way of disposal and clearance of oil sludge is its burning in furnaces of various designs (chamber furnaces, fluidized furnaces, rotary kilns etc.). For combustion of such wastes containing not more than 20% solids fluidized furnaces are commonly used. At burning of oil sludge containing up to 70% solids rotary kilns, allowing to burn waste of various granulometric composition, became widespread. The energy obtained in this case can be used to produce electricity and a district heating.

Acid tars stored in the storage ponds are a source of environmental pollution. Storage ponds of acid tars are located near all the large oil refineries. Currently many ways of processing of acid tars are offered. They can be divided into 4 groups: high temperature splitting, low temperature splitting, using as a fuel component for industrial furnaces and complex processing to produce fuel, coke and other products. At the high-temperature splitting acid tars are exposed to a temperature of about 800 - 1200 °C. The final product of processing - sulfuric acid, as an additional product forms solid residue (coke). Low temperature splitting has several methods. One of them is based on the neutralization of acid tar with ammonia forming ammonium sulphate and subsequent refluxing the mixture for separating organic compounds. It produces a fertilizer (ammonium sulfate). Acid tars can be burned as a liquid fuel. In this case, the organic portion of acid tar must first be separated in some way from the sulfuric acid. If acid in the tar is small, it can be burned together with the acid.

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Solution of a Direct Problem of Geothermy (Решение одной прямой задачи геотермии)

Oil field development of the Bazhenov formation is one of the important problem in the West Siberian region of Russia.

Experience has proved the high promising and great potential of oil-bearding of the Bazhenov formation, but their low permeability hampered industrial development of oil of the this formation.

Features of the Bazhenov formation:

- Wells with high oil flow rate are zones of abnormally high temperatures;

- Anomalous enrichment in organic matter (up to 10% or more);
- Low power at the area of distribution, exceeding 1 million km^2 ;
- Abnormally high values resistivity, greater than 500 Ohm-m;
- High and abnormally high values of natural gamma-ray activity;
- Abnormally low density rocks;
- Abnormally high reservoir pressure of the Bazhenov;
- Low porosity and permeability reservoirs of Bazhenov formation;

- Vertical and horizontal fractures.

The aim of work was to develope a simple mathematical model to describe the geothermal temperature distribution at the Bazhenov formation.

Formation of the task:

$\left[\lambda \frac{d^2 T}{dz^2} + \right]$	$\rho H = 0$
$\left \lambda \frac{dT}{dz}\right _{z=0}$	$=q_1$



Where λ –thermal conductivity, W/(m*K); *T* - temperature, K; *z* – depth, m; ρ – density, kg/m³; *H* – specific power of heat generation, W/kg; q_1 – heat flux on the surface, W/m². Distribution of heat flow in the rocks

Conclusion: direct problem of Geothermy was solved in progress; the result can be used for simulation of the thermal processes in reservoir condition caused by heat generation.

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Quasar (Квазар)

Quasar – a class of astronomical objects– is one of the brightest in the visible Universe – the power of radiation is sometimes tens and hundreds times greater than the total capacity of all stars in such galaxies as ours. The first quasars were identified as the objects with high redshift with electromagnetic radiation and so small angular sizes that within a few years after the discovery they failed to be distinguished from the stars. Quasars are active nuclei of galaxies. It is believed that they contain a supermassive black hole, which is as a result of the accretion draws the matter from the surrounding space. This leads to a huge mass of holes and powerful radiation exceeding the power of radiation of all stars in the galaxy. Recent observations have shown that the majority of quasars are located near the centers of huge elliptical galaxies.

According to one theory, quasars are galaxies at the initial stage of development, in which a supermassive black hole consumes the surrounding substance. Recently it is accepted to believe that the source of radiation is the accretion disk of the supermassive black hole at the center of the galaxy, and therefore the redshift of quasars is more than cosmological one on value of the gravitational shift predicted by Einstein in General relativity.

The quasars are compared to the beacons of the Universe. They are visible from huge distances, they contribute to the investigation of the structure and evolution of the Universe, determine the distribution of matter in the line of sight: strong spectral line of hydrogen absorption takes place in the forest lines at redshift absorbing clouds.

On average quasar produces about 10 trillion times more energy per second than the Sun and has a variability of radiation in all wavelengths. Many quasars vary in luminosity in short periods of time. It is, apparently, one of the fundamental properties of quasars. Today, quasars are defined primarily by red shift in their spectrum. If the detected in space object is of this shift and allocates a huge amount of energy, it becomes a prime candidate to carry the name quasar. Today they are identified in an amount of about 2 thousand. As technological progress moves forward, there is a chance in the future to learn the true nature of quasars.

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Hydroelectric power plants (Гидроэлектростанции)

Hydroelectric power plants are built on rivers. The old power station №1 near Niagara Falls in the United States began producing electricity in 1881. The first hydroelectric power plant Edison started working September 30, 1882, in Appleton, Wisconsin, USA. Sayano-Shushenskaya hydroelectric power plant is the largest in Russia. It is located on the Yenisei River, between Krasnoyarsk and Khakassia.

The production process at these plants is rather simple: the water flows into the hydroturbine runner, acts upon the runner blades and rotates the runner and the turbine shaft.

The generator shaft is connected to the turbine runner shaft. The difference in the water level influences the power capacity of a plant, i.e. the magnitude of the water head and the daily inflow of water fluctuates considerably according to the season.

Hydroelectric stations are divided depending on the power output.

Small hydro is the development of hydroelectric power on a scale serving a small community or industrial plant. The definition of a small hydro project varies but a generating capacity of up to 10 megawatts (MW) is generally accepted as the upper limit of what can be termed small hydro.

Micro hydro is a term used for hydroelectric power installations that typically produce up to 100 kW of power. These installations can provide power to an isolated home or small community, or are sometimes connected to electric power networks.

Pico hydro is a term used for hydroelectric power generation of under 5 kW. It is useful in small, remote communities that require only a small amount of electricity.

An underground power station is generally used at large facilities and makes use of a large natural height difference between two waterways, such as a waterfall or mountain lake.

Different types of turbines used in hydroelectric power plants.

Hydroelectric power plants have advantages and disadvantages. Hydroelectric power plants make use of renewable energy. The generated electric power is rather cheap and environmentally friendly.

But there is a threat of flooding of arable land surrounding hydroelectric power plants. Hydroelectric power plants cause reducing the amount of fish. Construction is carried out only where there are large reserves of water power. The level of water in artificial reservoirs is constantly and rapidly changing.

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Through-the-bit logging services (Геофизические методы исследования скважин через долото)

In horizontal and high-angle wells, the combined effects of borehole trajectory and geology (unconventional plays, unstable boreholes, poor-quality boreholes: washed out, rugose, or tortuous) hamper an operator's ability to acquire the data needed to assess a reservoir and develop a stimulation program to enhance payout.

Logging while drilling (LWD), tractor conveyance and various pipe-conveyed logging techniques are just a few of the options currently available.

ThruBit LLC developed a unique, cost-effective logging system, to help operators obtain valuable formation data in high-angle wellbores. The system uses mud pump pressure to deliver small-diameter logging tools down the center of the drillstring and out through a specialized bit to log the open borehole beyond. Traveling through this drillpipe conduit to total depth, the tools are pumped through the bit opening where they can survey the formation as the drillpipe is tripped out of the hole.

The following tools can be used: Telemetry, Memory, Gamma Ray Tool, Induction Tool, Neutron Tool, Density Tool and Sonic Tool. Any of these tools may be combined to permit operators to run a tripleor quad-combo logging string. All tool diameters are small enough to run in 4-in. holes.

This deployment system can positively impact a logging operation. The rig time spent on acquiring logs is reduced because deployment and acquisition can take place during the conditioning trip. Because they are not deployed until the bit is in position near total depth, the tools receive less exposure to shocks, vibrations and high temperatures. Risk is minimized because the tools are retrievable and the system provides the driller with full well control capability. Thus, if well conditions deteriorate, and the drillpipe becomes stuck, the logging tools and the density and neutron sources can be retrieved prior to activating jars or implementing other stuck pipe procedures. With the logging string laid out on the catwalk, the driller may jar the drillstring without fear of damaging the tools.

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Modeling of crack opening in heterogeneous stratum (Моделирование раскрытия трещины в неоднородном пласте)

Nowadays hydraulic fracturing is one of the most efficient methods which apply to increase the production of low-permeability reservoirs. The frac-fluid is pumped at a high pressure into a selected section of a wellbore. This fluid pressure creates a fracture extending into a rock medium which contains oil or gas. Either acid etching or a material such as sand (proppant) is injected to hold it open and allow fluids to flow, thereby increasing reservoir conductivity.

It is important to know the dimensions and the propagation characteristics of a hydraulic fracture in the design of fracture operations. Knowing the properties of reservoir rock, frac-fluid and the magnitude and direction of in-situ stress one seeks an accurate prediction of the dimensions (opening width, length, and height) of the hydraulically induced fracture for the given pumping rate and time. Many fracture models have been developed for this purpose.

Computer modeling process allows getting accurate prediction of fracture growth and dimensions. There are three main two-dimensional models: the Perkins-Kern (PK)/Perkins-Kern-Nordgren (PKN) & Geertsma-de Klerk- Khristianovic (GDK) models and the radial (RAD) model. In the PKN and GDK models, fracture height is assumed to be constant along the fracture length and set using lithological boundaries.

When considering hydraulic fracturing mechanics, one of the primary concerns is determining the elastic properties of rock, particularly with respect to Young's modulus and Poisson's ratio. Early development of hydraulic fracturing theory assumed that rocks behave as linear elastic materials, however, most rocks are heterogeneous and have been found to exhibit non-elastic behavior. That is why the purpose of this work is modeling of crack opening in heterogeneous stratum.

Mathematical model of the problem was built using the equilibrium equation, Hooke's law and the ratio of Cauchy. The problem is solving by finite-element method.

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Experimental study of dynamics of bubbly glycerol exposed to ultrasound (Экспериментальное исследование динамики пузырькового глицерина, подверженного ультразвуку)

The experimental study of dynamics of bubbly liquids exposed to ultrasound was carried out in our previous work [1]. It was found that cavitation devices reduce viscosity of hydrocarbon fuel. This allows us to reduce required heating and to increase the dispersion of fuel atomization [ibid]. We created a new experimental setup and began to work with glycerol.

The study of the dynamics of the bubbly front in glycerol at different acoustic frequencies and amplitudes was carried out. It has been found that besides overall vertical motion upward, some bubbles moved down, picking up the neighboring bubbles, which led to cluster formation. Then the cluster moved up and merged with the bubble front. The wave front looked like a densely packed bubble sheet. In the case of glycerol three regimes were revealed. Depending on the pressure, the front amplitude can have a spherical shape, can be slightly deformed and a small stream from the upper part of the front is observed.

In ultrasound field frequencies push out bubbles from glycerol, the viscosity of which is 75 mPa*s. Depending on the field intensity, the pressure of the bubble on the front structures differs. It is also different from the case with water. It is possible to identify three modes: 1) bubble front has a smooth round shape; 2) the front is slightly deformed; 3) the front is deformed significantly, it's cone-shaped.

Thus, cavitation was used for fuel processing. Cavitation devices reduce viscosity of hydrocarbon fuel. These devices are often used to improve the efficiency of combustion or disposal of water-bearing fuels.

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Oil extraction and recovery methods (Методы нефтедобычи)

There are three methods of oil extraction, depending on the pressure in the oil reservoir and its maintenance.

During the primary recovery stage, reservoir drive comes from a number of natural mechanisms. Recovery factor during the primary recovery stage is typically 5-15%. While the underground pressure in the oil reservoir is sufficient to force the oil to the surface, all that is necessary is to place a complex arrangement of valves on the well head to connect the well to a pipeline network for storage and processing.

Over the lifetime of the well, the pressure will fall, and at some point, there will be insufficient underground pressure to force the oil to the surface. After natural reservoir drive diminishes, secondary recovery methods are applied. They rely on the supply of external energy into the reservoir in the form of injecting fluids to increase reservoir pressure, hence replacing or increasing the natural reservoir drive with an artificial drive. On average, the recovery factor after primary and secondary oil recovery operations is between 35 and 45%.

Tertiary recovery begins when secondary oil recovery isn't enough to continue adequate extraction, but only when the oil can still be extracted profitably. This depends on the cost of the extraction method and the current price of crude oil. Tertiary recovery techniques are thermally methods (heating the oil, steam injection, fire flooding); surfactants injection; microbial method. Techniques that heat the oil, thus reducing its viscosity and making it easier to extract. Fire flooding is another form of TEOR, some of the oil is burned to heat the surrounding oil. Surfactants are injected to alter the surface tension between the water and oil in the reservoir, mobilizing oil, which would otherwise remain in the reservoir as residual oil. Microbial treatments method. Special blends of the microbes are used to break down the hydrocarbon chain in oil thus making the oil easy to recover as well as being more economic versus other conventional methods. Tertiary recovery allows another 5% to 15% of the reservoir's oil to be recovered.

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Particles in Love: Quantum Mechanics Explored in New Study

Here's a love story at the smallest scales imaginable: particles of light.

This idea, called "entanglement," is part of the branch of physics called quantum mechanics, a description of the way the world works at the level of atoms and particles that are even smaller. Quantum mechanics says that at these very tiny scales, some properties of particles are based entirely on probability. In other words, nothing is certain until it happens.

Testing Bell's Theorem

Albert Einstein did not entirely believe that the laws of quantum mechanics described reality. He and others postulated that there must be some hidden variables at work, which would allow quantum systems to be predictable. In 1964, however, John Bell published the idea that any model of physical reality with such hidden variables also must allow for the instantaneous influence of one particle on another. While Einstein proved that information cannot travel faster than the speed of light, particles can still affect each other when they are far apart according to Bell.

The paper by Shalm, Marsili and colleagues was published in the journal Physical Review Letters.

"Our paper and the other two published last year show that Bell was right: any model of the world that contains hidden variables must also allow for entangled particles to influence one another at a distance," said Francesco Marsili of NASA's Jet Propulsion Laboratory in Pasadena.

An analogy helps to understand the experiment:

Imagine that A and B are entangled photons. A is sent to Alice and B is sent to Bob, who are located 607 feet (185 meters) apart.

Alice and Bob poke and prod at their photons in all kinds of ways to get a sense of their properties. Without talking to each other, they then each randomly decide how to measure their photons, using random number generators to guide their decisions. When Alice and Bob compare notes, they are surprised to find that the results of their independent experiments are correlated.

Alice and Bob – representing actual photon detectors – then repeat this with many other pairs of entangled photons, and the phenomenon persists.

"Information can never travel faster than the speed of light – Einstein was right about that. But through optical communications research, we can increase the amount of information we send back from space," Marsili said. "The fact that the detectors from our experiment have this application creates great synergy between the two endeavors."

And so, what began as the study of "love" between particles is contributing to innovations in communications between space and Earth. "Love makes the world go 'round," and it may, in a sense, help us learn about other worlds.

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Molecular physics and thermodynamics (Молекулярная физика и термодинамика)

Molecular physics and thermodynamics are branches of physics which study macroscopic processes in bodies, and these processes are associated with large number of atoms and molecules contained in bodies. Molecular physics is a branch of physics which studies structure and properties of substances based on molecular-kinetic representations which are listed below.

1. Any body (solid, liquid or gas) consists of a large number of small particles – molecules.

2. Molecules of any substance are in endless chaotic motion.

3. The idealized model of an ideal gas is used. According to this model the volume of the molecules is much smaller than the volume of the vessel; there are no intermolecular forces; the collisions of gas molecules with each other and with the wall of the vessel are perfectly elastic.

4. Macroscopic properties of bodies (pressure, temperature) are described using statistical methods the basic concept of which is statistic ensemble. It means that behavior of a large number of particles is described by average characteristics (average speed, energy) of all ensemble, but not of a single particle.

Thermodynamics in contrast to molecular-kinetic theory studies macroscopic properties of bodies. It is not interested in macroscopic picture.

Thermodynamics is a branch of physics which studies common properties of macroscopic system which are in thermodynamic equilibrium and the processes of transition between the states of different systems.

There are three fundamental laws at the core of thermodynamics which are called the laws of thermodynamics. They are established on the basis of generalization of a large set of experimental facts. The molecular-kinetic theory and thermodynamics complement each other forming a unit but using different research methods.

Thermodynamic system is a set of macroscopic bodies that interact and exchange energy among themselves and with other bodies. The system state is defined by thermodynamic parameters (pressure, volume, temperature). These parameters are represented by set of physical quantities characterizing the properties of thermodynamic system.

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Quantenkaskadenlaser (Квантово-каскадные лазеры)

Bei einem Laser handelt es sich um ein technisches Gerät, das sogenannte Laserstrahlen erzeugen kann. Laserstrahlen gelten als elektromagnetische Wellen und werden heutzutage für vielfältige Anwendungen in der Industrie und Technik verwendet. Sie können etwa als kleine Lichtzeiger eingesetzt werden, aber eignen sich auch, um die Entfernung zu messen, können für komplexe Schweiß- und Schneidearbeiten verwendet werden oder dienen als Skalpell. Welche Eigenschaften ein Laser genau besitzt, wird mit der Erzeugung einer sogenannten stimulierten Emission und der Beschaffenheit des Resonators festgelegt. Die Geräte bestehen in der Regel aus einem aktiven Lasermedium, einer Pumpe und einem Resonator. Der Laser - ein Gerät, das die Energie (Licht-, elektrische, thermische, chemische und andere) in die Energie der kohärenten, monochromatischen Strahlen umwandelt und ein fokussierten Strahlungsfluss polarisiert.

Ein Weg, um den Laserstrahl zu erhalten, ist das Durchlaufen des elektrischen Stroms durch eine bestimmte Art von Halbleiter. Als Ergebnis: Elektronen im Inneren der Halbleiter machen "Sprung" auf ein höheres Energieniveau, und dann, unter bestimmten Bedingungen, "springen" zurück. Und so "läuft" die Energie in die Umgebung in Form eines kohärenten Stroms von Photonen, die die gleiche Länge der Lichtwellen sind.

Die Quantenkaskadenlaser wird anstelle des Halbleiters d.h. periodischer Struktur aus mehreren Halbleitern wenige Atome eingesetzt. Emissionselektronen treten beim Übergang von einer Schicht zur anderen. Als Ergebnis ist der volle Durchgang eines Photons aller Schichten mit der Aussendung mehrerer Elektronen, die den Namen der "Kaskade" tragen. Im Gegensatz zu herkömmlichen Lasern sind die Emissionsquantenkaskaden Analoga im Infrarotspektrum, das die Verwendung der Erfindung in der Medizin ermöglicht. Dieser Strahl ist leicht zu "tastend" in dem Medium, durch das passiert, auch mikroskopisch kleine Mengen an Rauch, Nebel und Gasen jeglicher Substanz, die Infrarotstrahlung absorbieren kann. In jeder Schicht des Quantenkaskadenlasers können die Elektronen nur ganz bestimmtes Energieniveaus annehmen. Liegt genau die richtige elektrische Spannung an, springen die Elektronen von Schicht zu Schicht und geben dabei jedes Mal Energie ab. So lässt sich die exotische Terahertzstrahlung mit einer Wellenlänge im Submillimeterbereich effizient erzeugen.

Viele Moleküle absorbieren Licht in diesem Wellenlängenbereich auf ganz charakteristische Weise, wodurch ein optischer Fingerabdruck entsteht. Dank dieser Eigenschaft kann Terahertzlicht für chemische Detektoren eingesetzt werden. Auch für bildgebende Verfahren in der Medizin ist diese Strahlung hochinteressant: Einerseits hat sie weniger Energie als Röntgenstrahlung, ist also nicht ionisierend und daher ungefährlich, andererseits hat sie aber eine kürzere Wellenlänge als Mikrowellenstrahlung, was zu besserer Auflösung führt.

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The Solar System (Солнечная система)

The Solar System is a planetary system, which includes a star and cosmic objects which rotate around it. The system is composed of eight planets: four terrestrial planets (Mercury, Venus, Earth, and Mars) and four gas giants (Jupiter, Saturn, Uranus, Neptune). Also Solar system has areas with small bodies: Asteroid belt, Trans-Neptunian object and areas with small objects. The first planet in the Solar system and the closest to the Sun is Mercury. Venus is the second planet in our system. Also, Venus is called the Earth's sister planet. The Earth is our home. It is the biggest terrestrial planet in the Solar System. The Earth has satellite which is called the Moon. Mars is the fourth planet in the Solar System. Mars is the place where Olympus Mons, the largest volcano, and The Valles Marineris, the one of the largest system of canyons in the Solar System are located. Mars has two moons, Phobos and Deimos. Gas giants follow Mars. Also, the Main asteroid belt lies between Mars and Jupiter. Jupiter is the fifth and the biggest planet in the Solar system. Jupiter has sixty seven moons; the biggest moons are Io, Europa, Ganymede and Callisto. Saturn is the second gas giant and it has sixty two moons, the biggest moon is Titan. Uranus is the first planet which was discovered in modern times by William Herschel in 1781. It is the coldest planet in the Solar System (-224 degrees Celsius). Neptune is the last and the most distant planet in the Solar system. Neptune was the first planet discovered with the help of mathematical calculations. The Trans-Neptunian object follows Neptune.

The asteroid belt is the area located between the orbits of Mars and Jupiter. The belt includes a lot of objects with different shapes which are called asteroids or minor planets. Also this area is called the main asteroid belt to distinguish it from other asteroids belts. The total mass of this belt makes up four percent of the mass of the Moon, about half the mass of the belt is concentrated in four largest objects: Ceres, Pallas, Vesta and Hygeia .Ceres is the largest dwarf planet in the Solar System and the closest to the Sun. Pallas is the biggest asteroid in the Belt. Vesta is the heaviest and the brightest asteroid in the Main asteroid belt. Hygeia is the fourth largest object after Ceres, Pallas and Vesta.

Trans-Neptunian object is the object of the Solar System. Trans-Neptunian objects form Kuiper belt, multiple disk and the Oort cloud. In July 2014, scientists found about 1500 trans-neptunian objects. The biggest objects among the Trans-Neptunian objects are Pluto and Eris. Pluto is the biggest dwarf planet in the Solar system and the biggest object in Kuiper belt. Its weight is six times less than mass of the Moon. The surface of Pluto is approximately equal to the square of Russia. Eris is the heaviest dwarf planet and the most distant from the Sun dwarf planet in the Solar System.

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Moderne Energiequellen (Современные источники энергии)

Die Sonnenenergie als eine der modernen Energiequllen hat viele Vorteile. Das Sonnenlich kostet selbst praktisch nichts.

Ein weiterer Vorteil der Sonnenenergie ist ihre «ökologische Sauberkeit».

Als eine der wichtigsten Energiequellen der künftigen Energiwirtschaft kann auch das Weltmeer betrachtet werden.

Es besitzt riesige Mengen an Energie. Dabei, tritt die Meeresenergie nicht als Konkurrent der Kernkraft oder Sonnenkraft auf, sondern als Partner. Besondere Vorteile dieser Energieart sind ihre Unerschöpflichkeit und Umweltfreundlichkeit.

Die potenzielle Energie der Gezeiten beträgt etwa 40 Mrd. kW. Das ist etwa das 7 fache der Energie, die alle Flüsse und Seen der Kontinente aufweisen. Gezeitenkraftwerke sind in solchen Gegenden zweckmäßig, wo große Tidenhübe auftreten und von Natur aus bereits weitflächige Becken vorhanden sind. Ausgezeichnete Bedingungen dafür bieten die Atlantikküste Frankreichs, die Severnmündung ['sevə:n] in England, die Fundy-Bucht [fand1] in Kanada, die Küste des Weißen Meeres u. a. Das zurzeit größte Kraftwerk befindet sich an der Ostküste Kanadas und hat eine Leistung von 1 Mio. kW.

In Russland wird die jährlich nutzbare Gezeitenenergie auf etwa 210 Mrd. kWh geschätzt. Geplant sind Kraftwerke mit einer Leistung von 340 MW am Lumbowsker Meerbusen, von 500 MW an der Mündung des Flusses Kuloi, von 2000 MW an der Flussmündung der Mesen und in der Zukunft ein Gezeitenkraftwerk von 14000 MW an der Mesener Bucht des Weißen Meers

Das Prinzip der Energiegewinnung ist relativ einfach. Durch den Bau eines Dammes entsteht ein natürliches, vom Meer abgeschlossenes Becken. Im Damm sind Rohrturbinen eingebaut. Sie werden von der Flut angetrieben, wobei sich gleichzeitig das Becken füllt. Bei Ebbe ist der Wasserstand im Becken höher und kann nochmals die Turbinen in Gang setzen.

Ein anderer Mechanismus liegt den thermischen Meereskraftwerken zugrunde. Diese Anlagen nutzen den Temperaturgradienten zwischen verschiedenen Meerestiefen aus. Die gesamte thermische Energie der Weltmeere wird auf etwa 30 bis 40x10¹⁵ W geschätzt. Das Temperaturgefälle kann 20 bis 25°C betragen. Im Kraftwerk besteht ein geschlossener Kreislauf des Arbeitsmittels (z. B. Propan oder Ammoniak), in dem dieses Arbeitsmittel die Stufen Verdampfen-Expandieren-Kondensieren durchläuft. Energielieferant ist die Temperaturdifferenz zwischen warmem und kaltem Meerwasser.

Das Schneekraftwerk.

Eine Forschergruppe der Universität von Akita in Japan will beweisen, dass selbst Schnee sich für die Energiegewinnung nutzen lässt.

Besonders in den nördlichen Landesteilen erreicht er Höhen bis zu drei Metern Bei solchen Schneehöhen ergibt sich eine genügend große Temperaturdifferenz zwischen der untersten und der obersten Schneeschicht, um sie für eine Energiegewinnung zu nutzen

Eine extrem niedrig siedende organische Flüssigkeit verdampft durch die «Wärme» der untersten Schneeschicht und die entstandenen Dämpfe treiben den Turbogenerator zur Elektroenergieerzeugung an.

Anschließend wird das Arbeitsmittel durch die kalte obere Schneeschicht wieder verflüssigt und steht für einen neuen Kreislauf zur Verfügung Die erste wirtschaftlich nutzbare Anlage mit einer installierten Leistung von 10 Kilowatt soll zu Fußen des 2230 Meter hohen Berges Chokai-san gebaut wurden.

Die erzeugte Elektroenergie ist für die Versorgung landwirtschaftlicher Betriebe in diesem Gebiet vorgesehen.

Die Salzenergie

Das Modell eines sogenannten Salz-«Kraftwerkes» wurde an der Technischen Hochschule in Göteborg erfolgreich erprobt.

Die labormäßige Versuchsanlage lieferte Elektroenergie nur für eine 4-Watt-Glühlampe, aber sie bewies trotzdem die technische Durchführbarkeit dieses neuen Weges der Elektroenergieerzeugung.

Werden Salz- und Süßwasser miteinander vermischt, so beginnen die Natrium- und Chlorionen des Salzwassers zu wandern, damit eine homogene Lösung entstehen kann.

Diesen Zwang zur Bewegung nutzt man zur Elektroenergieerzeugung.

Zu diesem Zweck wurde bei der Versuchsanlage zwischen das Salz- und Süßwasser eine ionenselektive Membran geschaltet, die nur eine Ionenart hindurch lässt.

Die auf diese Weise entstandene Potenzialdifferenz liefert Elektroenergie, wenn die Potenziale über Leitungen entladen werden.

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Calculation of natural gas hydrate formation conditions (Расчет условий гидратообразования природного газа)

Hydrating problem is relevant mainly in the production, transportation, focusing and storage of hydrocarbons. Certain thermobaric conditions are to be observed in order to avoid the process of nucleation of crystalline hydrates. Hydrate formation under appropriate conditions in the bottomhole zone of producing layer and in the well bore much complicates the process of exploration and exploitation of deposits significantly. Natural gas, a mixture of various components (Methane, ethane, propane, isobutane, nitrogen, carbon dioxide, hydrogen sulfide, etc.), in combination with water under certain conditions form hydrates - solid crystalline compounds. For each known individual gas there are equilibrium values of pressure and temperature at which the hydrates growth begins. For various mixtures of gases, such as natural gas, it is necessary to use special techniques that allow to calculate the conditions of hydrating. These conditions depend not only on the percentage of hydrocarbon gases, but on the presence of such natural components as carbon dioxide and hydrogen sulfide.

This paper describes a programm, based on the Ponomarev's methodology that enables to calculate the hydrate formation conditions for natural gas of known composition. The following parameters are to be entered into the dialog box: mole fraction of the components that make up the composition of natural gas; the density of the gas components in the air; temperature (or pressure) of natural gas. According to these data, the program calculates the pressure (or temperature) that the cause hydrate formation process.

Having such a program will makes it possible to estimate the possibility of hydrate formation and the need for laboratory studies. A further improvement of the program is associated with the influence of humidity and the presence of non-hydrocarbon gas components.

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Interpretation of Temperature and Pressure Profiles Measured in Multilateral Wells Equipped with Intelligent Completions (Интерпретация профилей температуры и давления, измеренных в многоствольных скважинах, оснащенных современными доработками)

This paper presents methods to interpret measurements in complex wells (horizontal, multilateral and multi-branching wells) to determine the inflow profiles of oil, gas and water. These methods are needed to take full advantage of intelligent well, a technology that is rapidly evolving to continuously and permanently monitor downhole temperature, pressure, and perhaps volumetric flow. To realize the value of intelligent wells, the efficient and accurate interpretation of the raw data being acquired is needed.

The interpretation of flow profiles of horizontal or multilateral wells from temperature and pressure profiles requires consideration of subtle effects that are often neglected. In this paper, we illustrate how some of these effects can be predicted, and how they can be used to evaluate complex well performance. In particular, we highlight the following characteristics of flow in horizontal wells, each of which can provide information about the inflow profile of the well.

The Joule-Thomson effects (the heating of oil and the cooling of gas) are discussed on the temperature profiles, seeing if there are noticeable changes or not. The discrete production cases are then considered to infer how the pressure or temperature profiles retain marks where the production starts and ends. Also, we examined well trajectories effects. Small inclinations $(+2^{\circ} \text{ and } -2^{\circ})$ in nominally horizontal laterals affect both pressure and temperature profiles. The differences in potential energy in up-inclined and down-inclined segments may prove to be diagnostic of relative flow rates of the phases. As a last example, water entry effects on the each profiles are shown. When the production becomes oil and water two-phase flow, the fluid properties change and affect the both profiles. In certain cases, the location of the water entry may be noticeable.

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The Process of Hydraulic Rock Fracturing (Процесс гидравлического разрыва пласта)

Hydraulic fracturing produces fractures in the rock formation that stimulate the flow of natural gas or oil, increasing the volumes that can be recovered. Wells may be drilled vertically from hundreds to thousands of feet below the land surface and may include horizontal or directional sections extending for thousands of feet.

The fracking process occurs after a well has been drilled and a steel pipe (casing) has been inserted in the well bore. The casing is perforated within the target zones that contain oil or gas, so that when the fracturing fluid is injected into the well it flows through the perforations into the target zones. Eventually, the target formation will not be able to absorb the fluid as quickly as it is being injected. At this point, the pressure created causes the formation to crack or fracture. Once the fractures have been created, injection ceases and the fracturing fluids begin to flow back to the surface.

Fractures are created by pumping large quantities of fluids at high pressure down a wellbore and into the target rock formation. Hydraulic fracturing fluid commonly consists of water, proppant and chemical additives that open and enlarge fractures within the rock formation. Up to 600 chemicals are used in a fracking fluid, including known carcinogens and toxins such as lead, uranium, mercury, methanol, hydrochloric acid and others.

The main element in the manufacture of hydraulic fracturing is the proppant. Deep in the bowels proppant pellets held created cracks in the open position, providing a more complete production of "black gold". The pellets have high strength - one square centimeter can hold up to 8 tons of cargo. At the optimum placement of the chips in the formation of magnesium silicate, can be up to ten times increase the flow of oil to the well.

There may be situations in which the formation fracturing lead to the expected result, e.g. intensification well production, but at the same time the flow into the well, of not only oil but also accompanying water (such as unexpected tightness nearby reservoir with water) may take place, which leads to a jump in water content level well and can negate the positive effects of this operation.

Hydraulic fracturing has its benefits and limitations. Some countries forbid conducting this technology because of danger of earthquakes, groundwater contamination and other risks. During this process, methane gas and toxic chemicals leach out from the system and contaminate nearby groundwater. Contaminated well water is used for drinking water for nearby cities and towns. There have been over 1,000 documented cases of water contamination next to areas of gas drilling as well as cases of sensory, respiratory, and neurological damage due to ingested contaminated water.

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Phased array (Фазированная антенная решетка)

Another method of steering is used in a phased array radar. This uses an array of similar aerials suitably spaced, the phase of the signal to each individual aerial being controlled so that the signal is reinforced in the desired direction and cancels in other directions. If the individual aerials are in one plane and the signal is fed to each aerial in phase with all others then the signal will reinforce in a direction perpendicular to that plane. By altering the relative phase of the signal fed to each aerial the direction of the beam can be moved because the direction of constructive interference will move. Because phased array radars require no physical movement the beam can scan at thousands of degrees per second, fast enough to irradiate and track many individual targets, and still run a wide-ranging search periodically. By simply turning some of the antennas on or off, the beam can be spread for searching, narrowed for tracking, or even split into two or more virtual radars. However, the beam cannot be effectively steered at small angles to the plane of the array, so for full coverage multiple arrays are required, typically disposed on the faces of a triangular pyramid (see picture).

Phased array radars have been in use since the earliest years of radar use in World War II, but limitations of the electronics led to fairly poor accuracy. Phased array radars were originally used for missile defense. They are the heart of the ship-borne Aegis combat system, and the Patriot Missile System, and are increasingly used in other areas because the lack of moving parts makes them more reliable, and sometimes permits a much larger effective antenna, useful in fighter aircraft applications that offer only confined space for mechanical scanning. As the price of electronics has fallen, phased array radars have become more and more common. Almost all modern military radar systems are based on phased arrays, where the small additional cost is far offset by the improved reliability of a system with no moving parts. Traditional moving-antenna designs are still widely used in roles where cost is a significant factor such as air traffic surveillance, weather radars and similar systems.

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Schwarze Löcher (Чёрные дыры)

Der Ausdruck "Schwarzes Loch" wurde von dem Physiker John Wheeler 1967 eingeführt, da ein solches Objekt wegen des Einschlusses aller Lichtwellen dem Auge völlig schwarz erscheinen würde. Tatsächlich sind seitdem Dutzende Schwarzer Löcher im Universum gefunden worden. Eines gibt es im Zentrum unserer Milchstraße, weitere in den Zentren anderer Galaxien.

Schwarzes Loch — Gebiet der Raum-Zeit, dessen Anziehungskraft so groß ist, dass es nichts verlassen kann, sogar mit der Geschwindigkeit des Lichts bewegende Objekte, einschließlich der Quanten des Lichtes selbst. Die Möglichkeit der Existenz solcher Gebiete sollten einige exakte Lösungen der Einstein-Gleichungen, die erste von denen wurde im Jahre 1915 von Karl Schwarzschild empfangen. Schwarzes Loch gibt eine Grenze, so genannten Schwarzschildradius. Nach ihrer Größe geordnet, unterscheidet man drei verschiedene Arten von Schwarzen Löchern:

1. Supermassive Schwarze Löcher. Sie werden im Zentrum von Galaxien vermutet und haben zum Teil eine Masse, die dem Milliardenfachen unserer Sonne entspricht. Dennoch sind sie nicht größer als unser Sonnensystem. Obwohl die meisten Forscher heute überzeugt sind, dass es solche Objekte gibt, fehlt bisher der endgültige Beweis. Und den zu erbringen ist es gar nicht so einfach. 2. Stellare Schwarze Löcher. Obwohl sie nur einen Durchmesser von wenigen duzenden Kilometern haben, ist in ihnen die Masse von mehreren Sonnen konzentriert. Sie sind abgestorbene Sterne, die ihren Nuklearen Brennstoff verbraucht haben und durch die Wirkung ihres eigenen Schwereffekts zu extrem kompakten Objekten geschrumpft sind.

3. Winzige primordiale (urzeitliche) Schwarze Löcher. Ihre Masse beträgt lediglich einige Milliarden Tonnen, das entspricht ungefähr der Masse eines großen Bergmassivs, und ihr Durchmesser ist kleiner als ein Atomkern. Sie sind vermutlich durch die extremen Umweltbedingungen während des Urknalls entstanden. Ihre Anziehungskraft ist jedoch so klein, dass sie fast keine Materie verschlucken, stattdessen verlieren sie ihre Masse durch einen quantenphysikalischen Effekt, sie verdampfen sozusagen. Bisher gibt es für diese Exoten jedoch noch keinen einzigen Hinweis, sie existieren lediglich in der Theorie.

Derzeit verwenden die Wissenschaftler unterschiedliche Methoden und moderne Geräte und Technik, zum Beispiel Teleskopen und Spektrographen, für die Entdeckung von schwarzen Löchern, die sich in der Nähe von uns (nach kosmischen Maßstäben) und für die Milliarden Lichtjahren von uns befinden.

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What is Plasma? (Что такое плазма?)

The word plasma has significant importance in both physics and biology, though the term in physics is derived from the term in biology. Here, I will try to shed some light on plasma, and the way plasma in biology differs from plasma in physics.

In physics, to put the definition very simply, plasma is a fourth state of matter that comes after solid, liquid, and gas. This state of matter is achieved when gas is heated to the extent that the atoms of the gas lose all electrons. The resultant quasi-gas is a collection of nuclei and electrons that are free. The nuclei which have lost all the electrons are deemed to be ions, that is, they are electrically charged, to a substantial extent. The entire collection is thus, electri-

cally charged and conductive. The basic process that takes place in formation of plasma is quite simple. When heated, energy gets pumped into the gas. This causes that gas to disassociate itself from its molecules and take the form of atoms, which further lose their negatively charged electrons. The atoms themselves retain positive charge and are thus deemed to be positive ions. Plasma, thus, cannot occur naturally. It needs a controlled environment of electromagnetic field to survive without reacting. Stars, existing in space, are the best example. The vacuum of space prevents them from reacting. Scientists have laid down certain parameters that define plasma. These parameters include the approximation of ions and electrons, the frequency and volume of iterations, size, lifetime, density, temperature, and magnetic fields.

In biology the term is more properly indicated as blood plasma. It has a whitish-yellow appearance and is the medium which hosts all our blood cells. It is separated by a membrane from the organs of the cell. Plasma is made of 90% water. The remaining portion is proteins, glucose, clotting factors, mineral ions, hormones, and carbon dioxide. The term plasma, when used in the biological context, is always accompanied with the prefix blood. Blood plasma is the major material in human blood, whereas plasma in physics is the largest material substance in the universe.

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Numerical modeling of high-frequency and ultra high-frequency electromagnetic waves effect on heavy crude oil (Численное моделирование воздействия высокочастотных и сверхвысокочастотных электромагнитных волн на тяжелую нефть)

High oil prices allow you to use almost all the methods of its extraction. Leading oil companies are considering crude oil and heavy grades of bitumen as a strategic reserve. World's geological reserves of heavy hydrocarbons are estimated at 4.7 trillion barrels of oil equivalent. And now, a characteristic feature of the modern world's oil production is the structure of raw materials share of hard inventory.

Possibility of using high-frequency and ultra high-frequency electromagnetic waves is being actively explored in the designing of oilfields with difficult extracting conditions at this moment, because electromagnetic effect on the productive layer has a number of advantages in comparison with other methods.

Electromagnetic waves transmitting in a cylindrical waveguide of circular cross section are being studied in work. The problem is reduced to the Bessel equation which has been solved analytically and numerically by the method of control volumes.

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Polyheteroarylenes synthesis of halogenated aromatic monomers (Синтез полигетероариленов из галогенсодержащих ароматических мономеров)

Polyarylene polymers due to the high number of chemical and thermal stability are promising in terms of creating structural materials [1].

An efficient synthesis of biaryls (diarenes) from aryl chlorides has been developed and investigated. The coupling reagent is a catalytic mixture of anhydrous nickel salt and triphenylphosphine in the presence of a reducing metal (Zn, Mg, or Mn) [2]. Exceas reducing metal drives the coupling process and allows even aryl chlorides to be coupled to high yields, a distinguishing advantage over previous coupling processes which employed stoichiometric zero-valent nickel reagents. The reaction is pseudo-zero-order in aryl chloride and is promoted by 2,2'-bipyridine and by halide salts (F < C1 < Br < I) [3].

High molecular weight polyarylethersulfones are produced by nickel catalyzed coupling of aryl dichloride monomers. Metallic zinc is used to drive the polymerization reaction which takes place under relatively mild conditions in the presence of triphenylphosphine and a dipolar aprotic solvent. The versatility of the reaction is demonstrated, as well as the ability to provide a variety of high temperature polymers from readily available and inexpensive monomers:

$$2\mathbf{R} - \underbrace{\mathbf{O}}_{\mathrm{Cl}} + \mathbf{Zn} \xrightarrow{\mathrm{NiCl}_2, \mathrm{PPh}_3}_{\mathrm{DMAc}, \mathrm{N}_2, \mathrm{80^\circ C}} \mathbf{R} - \underbrace{\mathbf{O}}_{\mathrm{Cl}} + \mathbf{ZnCl}_2 \\ > 98\%$$

It is possible to use an integrated two-step process to produce aryl dichlorides from inexpensive aryl chlorides, and then to couple these directly to polymer without need for isolation and purification.

This process resulted from a fundamental understanding of the chemistry and the use of statistically designed experiments to identify the important reaction parameters and to optimize the degree of polymerization [4, 5].

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Precious metals and jewels in medicine

The twenty first century is the century of innovations and technologies. There is a lot happening in medicine too. A huge variety of the medical equipments, tools, artificial limbs and many other things appeared lately. All this demonstrates prompt development and use for this purpose of various materials including precious metals and jewels.

Jewels have found broad application in surgery, dentistry and pharmacy. For example, diamond is used in production of surgical tools which are actively used in high-precision operations. Artificial sapphire is applied to production of dental braces. Amber is applied as a B3 vitamin source. Pearls are known as a calcium source in pharmaceutical industry.

Precious metals are widely applied in production of various medicines, dentures. Use of precious metals in medicine is caused by the fact that these metals are inert, they don't react with other elements in neutral environment. Platinum alloys with iridium, palladium and gold are almost irreplaceable in production of needles. Other medical substances containing precious metals are widely spread caustic silver and silver protein. Precious metals are applied in radiation therapy (needles from radioactive gold are used to destroy malignant tumors) and also in substances that increase protection of an organism. Metallotherapy is used in cosmetology not widely, but effectively. The main shortcoming is high cost.

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Gewässerschutz in Deutschland und Baschkortostan (Охрана водных ресурсов в Германии и Башкортостане) 1. Aktualität des Gewässerschutzproblems

Eine zu starke Nutzung und Zerstörung der Natur durch die menschliche Tätigkeit hat katastrophale Folgen für die Umwelt. Ein

durch und durch aktuelles Problem ist daher der Gewässerschutz. Der Mangel am sauberen Trinkwasser und schlechte Sanitärversorgung sind wie bekannt Auslöser für Krankheiten und soziale Konflikte. Deshalb wurden in vielen Ländern innovative Technologien für verantwortungsvollen Umgang mit Wasser entwickelt.

2.1. Innovative Technologien für den Gewässerschutz in Deutschland

Die deutschen Fachleute schlugen z. B. sogenannte UV-Lichtanlagen und verschiedene Filtersysteme vor, um das Abwasser zu reinigen und es im Haushalt erneut zu nutzen. In Deutschland werden auch spezielle mikrobiologische Technologien zur Besserung der Grundwasserqualität angewandt. Diese basieren auf dem Gebrauch von einem Netz feiner Sensoren, die im Boden eingelassen sind, um den mikrobiologischen Prozeß im Grundwasser zu überwachen. Das Problem der Wasserknappheit versucht man in diesem Land mit Hilfe der Regenwasseraufbereitungsfilter zu lösen. Gesäubertes Regenwasser kann dann direkt in die Gewässer abfließen.

2.2. Gewässerschutzzustand und -maßnahmen in Baschkortostan

Große Aufmerksamkeit wird dem Gewässerschutz auch in Baschkortostan geschenkt. 2000 wurde das Präsidentenprogramm "Trink- und Mineralwässer der Republik Baschkortostan" angenommen. Die Hauptziele des Programms sind Gesundheitsschutz der Bevölkerung, Minderung der Gewässerverschmutzung und Abnahme der Grund- und Oberflächenwassererschöpfung. Um diese Ziele zu erreichen, werden folgende Maßnahmen getroffen:

- Reinigungsanlagenbau;
- Inbetriebnahme der Rückwassernetzsysteme;
- Aufbesserung der Schneespeicherung;
- Steigerung der Wasserbeckenfunktionsfähigkeit;
- Grundwasserqualitätsüberwachung von den Industriebetrieben.

Trotzdem läßt der Gewässerschutzzustand in Baschkortostan noch viel zu wünschen übrig. Durch die Ackerbewässerung und Wasserversorgung nimmt die Naturgewässererschöpfung heftig zu. Das zweite Problem ist die Gewässerverschmutzung. Da Baschkortostan ein industrielles Ballungsgebiet ist, enthält der verschmutzte Ablauf der Großflüsse Chloride, Sulfate, Phosphor, Erdölprodukte, Quecksilberverbindungen. Die Hauptlast fällt dabei auf Ufa, Sterlitamak und Salawat. Kleinflüsse und Seen werden durch die Abläufe der Viehzuchtfarmen verschmutzt.

Unsere Fachleute schlagen folgende Wege zur Lösung der genannten Probleme vor:

- Minderung der Industrieabwässer;

- Reinigung der Flußbetten und des Hochwassergeländes;

- technologische Weiterentwicklung und Abfallverwertung;

 Vermeidung der Gewässerverschmutzung durch Dünger und Pestizide;

- Vervollkommnung der Grundgewässerüberwachung nicht nur in den Groß-, sondern auch in den Kleinbetrieben.

2.3 Untersuchung der Gewässerqualität am Beispiel des Soldatensees

Noch als Schülerin und Teilnehmerin des Ökologischen Zentrums versuchte ich 2009, die Gewässerqualität am Beispiel des Soldatensees im Ufaer Jakutowpark zu erforschen. Zuerst wurden von mir die Wasserproben in der Nähe des Ufers gemacht. Wegen der vielen Beimischungen war das Wasser recht trübe und hatte einen unangenehmen Geruch. An den etwas tieferen Stellen sah ich (in einem Boot) das gleiche Bild: viel Müll und Fäulnis, was die Gewässerqualität bedeutend verschlechterte. Dabei zeigte das Thermometer einen für Anfang Mai zu hohen Wert der Wassertemperatur (16 Grad C). Das bekräftigte die Meinung der Wissenschaftler: je schmutziger ist das Wasser, desto höher ist dessen Temperatur.

Also, meine Untersuchung zeigte, daß die Gewässerqualität im Soldatensee sehr schlecht ist.

Trotz des antisanitären Zustandes wird der See nur selten gereinigt. Auch eine Bootsausleihstation und ein Restaurant am Seeufer helfen kaum das Problem zu lösen. Aber nicht die Parkadministration allein ist für den Seezustand verantwortlich. Wir alle sind doch in der Lage, keinen Müll ins Wasser zu werfen!

3.1. Ursachen des zur Zeit schlechten Gewässerzustandes

Zusammenfassend muß man betonen, daß die Ursache des schlechten Gewässerzustandes das Resultat einerseits der irrationalen

Wirtschaftstätigkeit, andererseits des naturunfreundlichen Verhaltens der Menschen ist.

3.2. Ein jeder muß für Gewässerschutz sorgen

Um am Gewässerschutz mitzuwirken, braucht man gar kein Politiker oder Betriebsleiter zu sein. Die Flüsse und Seen sind ein unentbehrlicher Bestandteil unserer Umwelt. Wenn wir die Gewässer im naturnahen Zustand bewahren können, werden wir ohne Zweifel das Leben auf der Erde verlängern.

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Emulsions in food industry

(Эмульсии в пищевой промышленности)

An emulsion is a mixture of two or more liquids that are normally immiscible (unmixable or unblendable). Emulsions are part of a more general class of two-phase systems of matter called colloids. The basic types of emulsions include direct emulsions with non-polar liquid droplets in a polar medium (such as "oil in water"); inverse or inverter emulsions (such as "water in oil"); liophilic emulsion are formed spontaneously and thermodynamically stable and lyophobic emulsions occur during mechanical, acoustic or electric emulsification.

Emulsions are formed in two ways: by droplet breakup and through the formation of films with breaking into small droplets.

The first method is carried out by slow addition of the dispersible substance in a dispersed system with emulsifier and vigorous stirring. The main factors which determine the degree of dispersion of the particles obtained are its stability, the stirring speed, the speed of dispersible material adding, its quantity, nature and concentration of emulsifier, and the temperature.

The second method is as follows: the liquid (e.g. oil) with slow addition to disperse phase forms film. This film is broken by air bubbles coming out of the holes of the tube that are at the bottom of the vessel. This is the way small individual droplets a developed. At the same time the air bubbles stir the liquid vigorously and therefore contribute to further emulsification. Nowadays, to obtain a concentrated emulsion with water, it is subjected to ultrasonic exposure.

Emulsions can disintegrate spontaneously. In practice, it is sometimes necessary to speed up the process of emulsions destruction. It can be done in various ways: 1) chemical destruction of the emulsifier protective films by the suitable reagent; 2) addition of emulsifier to cause the phase inversion of emulsion and thus lowering strength of the protective film; 3) adsorptive substitution of emulsifier by surfactant with having no ability to form reasonably durable films; 4) thermal destruction; 5) mechanical destruction; 6) the electric current or electrolytes impact.

The product that best reflects the properties of aromatic emulsions are non-alcoholic and alcoholic beverages. Emulsifier, which is a part of emulsion, provides not only the stability, but also acts as an "opacifying" agent that enables to produce a special kind of drinks -"cloudy beverage". By branched polysaccharide structure emulsifier acts as an adsorbent aromatic portion, providing drink with subtle and soft flavor. The use of emulsions are of great importance in the production of beverage sweeteners, since these drinks often have empty, unbalanced taste due to lack of components. Essential oils, included in the emulsions, give drinks natural taste and aroma.

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Optimization of the method of producing barium ferrate (Оптимизация способа получения феррата бария)

Ferrate ion is a very strong oxidizing agent. Besides its oxidizing properties a ferrate ion is a good coagulant because the product of the reduction is $Fe(OH)_3$. Ferrate ion forms a precipitate 15 times less in volume than $Fe(OH)_3$, which is very important for production, pro-

cessing and disposing precipitates. Thus ferrate ion is one of the strongest environmental friendly oxidizing agents.

Water purification is based on modern developments but its quality analysis is energy-consuming and labor-consuming, because of using muffle furnaces which means spending a lot of energy, therefore losing volatile radionuclides.

Concomitantly with technologies some alternative solutions are arising. One of such alternative techniques is the technology of identification of summarized alpha-, beta- activity with the help of BaFeO₄.

This solution has great advantages in its area.

The aforementioned method economizes electrical energy because of non-necessity in boiling off the precipitate from aqua. Muffle furnaces are not needed as ferrate ions concentrate radionuclides in the solid phase and can precipitate them from solutions, also a quantitative yield of radionuclides does not depend on contributable amount of ferrate ions.

Thus studying the techniques of optimization using ferrate ions is a very important and relevant problem.

The following reaction demonstrates the degrading of toxicity:

 $\begin{aligned} & Fe_2O_3 \bullet H_2O + 4KOH + KClO_3 \rightarrow 2K_2FeO_4 + KCl + 5H_2O, \\ & BaCl_2 + K_2FeO_4 \rightarrow BaFeO_4 + 2KCl. \end{aligned}$

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Alcohol as Non-alimentaruis Nutritive Factor (Алкоголь как антиалиментарный фактор питания)

The food safety is a difficult complex problem that can be solved not only by scientists (biochemists, microbiologists, toxicologists, etc.), but also the manufacturers, sanitary service workers (epidemiological service) state bodies and, finally, consumers. Food safety is one of the main factors determining the health of people and the preservation of the gene pool.

Foreign chemicals can enter the food as randomly polluting contaminants, e.g. from the environment or during processing when contacted with the equipment; sometimes they are introduced specifically in the form of food supplements, when it is connected with technological necessity. In addition, food raw materials and finished food products may contain natural ingredients that have a harmful effect on human health

These include non-alimentaruis nutritional factors contained in raw materials and finished food products and can have adverse effects on the human body; they belong to inhibitors of digestive enzymes. This group includes substances of protein nature that block the activity of digestive enzymes.

Non-alimentaruis nutritional factors include cyanogenic glycosides which upon enzymatic or acid hydrolysis isolate hydrocyanic acid; alkaloids organic compounds that have very different effects on the human body; and alcohol which is regarded as a refined food product that has only the energy value. When the alcohol is consumed in large quantities the enzymes can not work, there is an accumulation of ethanol and acetaldehyde, which causes extensive intoxication symptoms (headache, nausea, irregular heartbeats). Gastric juice, under the influence of alcohol, contains more hydrochloric acid and less digestive enzymes which catalyze cleavage of protein, fat, carbohydrate and other nutrients. During frequent and copious consumption of alcoholic beverages liver cells are killed of alcohol intoxication. Besides, alcohol causes changes in the cell cytoplasm and nucleus. It also promotes bonding of red blood cells Alcohol affects the endocrine system of the body the recent research show that even a single intake of alcohol lowers blood levels of male sex hormone - testosterone. Thus, alcohol can be regarded as the non-alimentaruis factor leading to specific metabolic disorders.

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Carbon and carbon compounds (Углерод и углеродные соединения)

It is well known that the element carbon plays an important role in the life on Earth. If all the carbon and carbon compounds were suddenly removed from the earth it would look like the surface of the moon. Many of the little everyday things would be quite impossible without the element carbon. In on ordinary pencil, for example, the inside of the pencil made from graphite, which is an elementary form of carbon, the wood and the paint on the surface of the pencil are all carbon or carbon compounds. The paper of a book, the cover and soon are also made of carbon compounds. All of the clothes one wears including shoes cannot exist without carbon. If carbon compounds were removed from the human body, there would be nothing left except water and a small residue of minerals and the same is true for all forms of living matter. Fuels, foods and many drugs are mostly made of carbon compounds. In addition, many carbon compounds such as plastics to be connected, with the life processes play a vital role in one's life.

There are nearly two million different carbon compounds to have been studied and described in the chemical literature with thousand of new ones, which are reported every year. Although there are 89 other naturally occurring elements, the number of known carbon compounds is many times greater than that of the known compounds which contain to carbon. The very large and important branch of chemistry, which studies and investigates carbon compounds, is called organic chemistry. The name "organic" comes from the past when chemical compounds produced from ones-living matter were called "organic" and all other compounds were called inorganic.

The importance of carbon chemistry for man is great. Every month several hundred new organic compounds are prepared. A few of these new compounds become important as medicines, plastics, textiles, solvents, food additives, cosmetics or some other products. A very few number may provide an important explanation of the mechanism of fundamental chemical reaction in the human body. Most, however, become laboratory findings and for the present, at least, have no practical application. The preparation of new and different compounds through chemical reaction is called organic synthesis. The million or so organic compounds now known and characterized were synthesized in the laboratories of the world in the past 150 years.

Complex mixtures of hydrocarbon compounds containing only carbon and hydrogen occur in very large quantities in nature as petroleum and natural gas.

Many other organic compounds are prepared from these materials after they are separated into their constituents. From the simplest hydrocarbon, methane, come such products as plastic vessels, acrylic fibers, vinyl paints, etc.

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Schwermetalle im Boden (Тяжёлые металлы в почве)

Seit der industriellen Revolution in der zweiten Hälfte des 18. Jahrhunderts sowie im Zuge der fortschreitenden Industrialisierung hat die Verwendung von Metallen als Bau- und Werkstoff zugenommen. Durch diese Aktivitäten des Menschen sind insbesondere Schwermetalle in immer größerem Maße in die Biosphäre gelangt. Als Quelle der Emissionen in Verbindung mit einer breiten Verteilung von Schwermetallen in der Umwelt durch anthropogenes Handeln sind z.B. der Bergbau zur Rohstoffgewinnung und die Verbrennung fossiler Primärenergieträger wie Erdöl und Kohle zu nennen. Schwermetalle besitzen im Vergleich zu anderen Schadstoffen eine äußerst lange Verweilzeit in Ökosystemen und werden über lange Zeiträume in der Umwelt akkumuliert.

Die chemische und metallverarbeitende Industrie emittiert Schwermetalle hauptsächlich in Form von Stäuben und Aerosolen. Das Ökosystem Wald wirkt als Senke für Schwermetalle in der Atmosphäre. Stäube werden gravitationsbedingt im Kronenraum der Bäume abgelagert. Durch Auswaschung gelangen Schwermetalle aus Aerosolen mit den Niederschlägen direkt auf den Boden.

Auf Grund ihrer großen inneren und äußeren Oberfläche besitzen Böden ein sehr großes Adsorptionsvermögen für Metalle und andere Verunreinigungen. Nicht zuletzt wird diese Eigenschaft bei der Trinkwassergewinnung genutzt. Doch das Adsorptionsvermögen von Waldböden für Schwermetalle ist begrenzt. Es wird durch die organischen und mineralischen Komponenten der Bodenmatrix bestimmt und durch den chemischen Bodenzustand modifiziert. Da Böden ein heterogenes Gemisch aus einer Vielzahl von organischen, organisch-mineralischen und mineralischen sowie löslichen Substanzen bilden, sind die Bindungsformen von Schwermetallen in Böden äußerst variabel.

Waldböden haben durch den jahrzehntelangen Einsatz von Bleialkylen als Antiklopfmittel im Benzin, aber auch durch Verhüttung von Blei-Erzen sehr großen Mengen an Blei in der Humusschicht akkumuliert. Blei ist (neben Zink) das mit Abstand in größten Mengen deponierte Metall in Oberböden. Auch Kupfer ist, ähnlich wie Blei, in großen Mengen in den oberen Bodenschichten akkumuliert und kann im Falle einer Lösung und Mobilisierung durch seine hohe Phytotoxizität bei überschreiten einer kritischen Dosis die Pflanzenwelt schädigen. Eine Belastung des Bodens mit Kupfer kann aus dem Abbau und der Verhüttung des Metalls herrühren, aus der Messingherstellung, aus Betrieben und aus dem übermäßigen Gebrauch von Chemikalien in der Landwirtschaft. Alternativen zur Anwendung von Kupfer als Pflanzenschutzmittel werden derzeit gesucht, allerdings kann sowohl im ökologischen als auch im konventionellen Landbau auf den Einsatz von Kupfer als Fungizid noch nicht verzichtet werden. Das Schwermetall Chrom ist zwar in geringen Dosen ein für Menschen und Tiere essentielles Spurenmetall, kann aber bei erhöhten Konzentrationen eine Gefahr für die Umwelt darstellen. Chrom tritt in verschiedenen Oxidationsstufen auf, von denen Chrom(III) und (VI) die stabilsten und damit häufigsten sind. Während das Chrom(III) als weniger toxisch eingestuft wird, ist die Chrom(VI)-Spezies für Pflanzen toxischer und wirkt auf Menschen karzinogen. Hauptemissionsquellen für Chrom sind die Verbrennung von Kohle und Erdöl, sowie die Stahl und Eisenproduktion. Allerdings sind Kenntnisse über das Verhalten von Chrom in Böden nicht ausreichend vorhanden, so dass die Untersuchung zum Verbleib des in Böden gebundenen Chroms notwendig ist.

Ein großes Problem neben der Belastung von Waldböden mit Schwermetallen ist die zunehmende Bodenversauerung. Viele Anstrengungen wurden in den letzten Jahrzehnten unternommen, um das Verhalten von Schwermetallen in Böden vorherzusagen mit dem Ziel, Risiken abzuschätzen.

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Funktionsweise des Ionen-Plasma-Antriebs (Принцип работы ионно-плазменного двигателя)

Das Thema meines Vortrags ist "Funktionsweise des Ionen-Plasma-Antriebs". Das Ziel des Projekts besteht darin, die Einsatzmöglichkeiten des Ionenantriebs unter irdischen Bedingungen zu erforschen.

Die Nutzung einer Hochvoltspannung für die Erzeugung der mechanischen Energie macht diese Projektstellung durchaus aktuell.

Die zu lösende Aufgabe – der Einsatz des Ionenantriebs – trägt dazu bei, die Masse der Ausrüstung zu reduzieren und eine umweltsichere Erzeugung der mechanischen Energie durch Sparspeisung des Antriebs zu erreichen.

Beschreibung des Ionenantriebs

Der Ionenantrieb ist ein elektrischer Raketenantrieb, dessen Funktionsweise basiert darauf, daß Rückstoßdruckerzeugung durch die im elektrischen Feld maximal beschleunigten Ionen erfolgt.

Heute sind Ionenantriebe ein aussichtsreiches Forschungsvorhaben auf dem Gebiet des Raumantriebsbaus. Hybride Ionenrückstoßantriebe haben einen von 20 bis 30 % höheren Antriebswirkungsgrad als standardmäßige Rückstoßantriebe. Die Funktionsweise des Ionenantriebs besteht darin, daß es bei der Generierung der hochfrequenten Hochvoltspannung an den Läuferenden zum Auftreten von Plasma kommt, was zu einer raketengetriebenen Elektronenemissionsbewegung des Läufers führen kann. Dabei sind die Geschwindigkeit und der Drehmoment von folgenden Paremetern abhängig: - Gesamtvolumen der Ionisation;

- Speiseparameter (Stromstärke und Spannung);
- Läufermasse;
- Art und Typ der ionisierenden Düse;
- Ionisationsgrad der Gasatmosphäre;
- Abführungs (Deionisations) geschwindigkeit des Arbeitskreislaufs.

Zum Schluß muß man folgendes betonen. Diese Technologie kann auf verschiedenen Gebieten, welche eine billige Erzeugung der mechanischen Energie erfordern, angewandt werden. Das sind zum Beispiel Energetik, Schwerindustrie, Verkehr, Flüssiggasproduktion und andere.

Daneben besteht auch die Möglichkeit, diese Technologie für die Indikation der Hochspannung beim Stromtransport anzuwenden.

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Biochemistry (Биохимия)

The chemistry of life, or «biochemistry» as chemists call it, is an area in which the classical fields of chemistry and biology meet. It can be called, molecular biology. Biochemistry is known to be the study of the structures and reactions of the thousands of compounds involved, in life process. It is considered to be the most complex area of chemistry.

Living things are supposed to represent the most efficient, sophisticated, compact chemical «factories» ever known. How, for example, do cells of the body know when to divide and multiply into new cells having the same characteristics as the original cells? When the body is afflicted by disease or by a wound how does the body protect itself and repair the damage? We know these processes to invole thousands of different chemical compounds.

When we compare the nervous system to man-made electronic computers the efficiency and complexity of the biological systems become even more impressive. Despite great advances in computer technology, the greatest computer ever built is almost insignificant being compared to a human brain weighing little more than a kilogram. A computer can perform mathematical operations million of times faster than a person, but think of some of the things the nervous system can do. For example, it can cause your arm to reach out and touch an object. The brain can translate signals from the retina of the eyes into three dimensional colour images. It can translate a series of frequencies detected by the ear into thoughts whereas a computer can only perform operations being programmed by a person. As to the storage capacity the brain really wins out. The largest computers have storage capacity of about one million «words» but some experts believe the brain, to store up all the signals it receives.

The chemical processes of our bodies involve enormously complex sequences of reactions details of these processes being for from complete understanding. Nevertheless great progress has been made in our understanding of the processes that occur in the body.

The first half of this century might be termed the Golden Age of Physics because so many discoveries in understanding the structure of molecules, atoms and nuclei were made. By the same virtue we may be in the midst of a Golden Age in Biochemistry. The next few years of research may bring much increased understanding of chemical processes in cells.

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The essence of titrimetry (Основы титриметрии)

Titration method of analysis is based on the accurate measurement of the volume of titrant of a given concentration consumed in the reaction with the analyte. Substances react with each other in equivalent amounts (n1 = n2). Since n = cV, where c is the molar equivalent weight, and V is the volume in which a substance is dissolved, the two stoichiometric ratio of the reactants are true:

$c_1V_1=c_2V_2$ (the Golden rule of analysts)

Here we can find the unknown concentration of a substance if we know the volume of its solution and the amount and concentration of the substances that reacted with it.

Knowing the molecular weight equivalent to M, we find the mass of the substance:

$m_2 = c_2 M_2$

To detect the end of the reaction, which is called the endpoint (EP), the solution with a known concentration of substances (called the titrant, T) gradually, in small portions, is added to the solution of the substance A. This process is called titration. After adding each portion of titrant solution into the equilibrium reaction of titration we get the following:

$aA+tT \Leftrightarrow products$

Titration reactions should meet the following conditions: 1) to be strictly stoichiometric; 2) to undergo quickly; 3) to undergo quantitatively, however an equilibrium constant should be high; 4) there must be a way to fix the point of equivalence.

Experimentally, the end of the titration is set to change the color of the indicator or some physical and chemical properties of the solution. This point is called the endpoint of titration (EPT), and, in general, does not coincide with the theoretically calculated equivalence point.

The method of acid-base titration is very widely used in pharmaceutical analysis. Many drug substances by their chemical nature are bases or acids and, therefore, their quantification is possible using acidimetry or alkalimetry. The use of non-aqueous media further enhances acid-base titration, and the ability to detect the endpoint of the titration physical methods makes acid-base titration one of the most important methods of pharmaceutical analysis.

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Osmium (Осмий)

Osmium (lat. *Osmium*), Os, a chemical element of Group VII of the periodic system, atomic number 76, atomic weight 190.2, belongs to the platinum metals.

Properties: density of 22.61 g / cm³, a melting point of about 3027 °C. Osmium is a tin-white metal with a grayish-blue tint. This is one of the hardest of all metals. Nevertheless osmium sponge may be easily triturated because it is brittle. Osmium melts at a temperature of about 3000 °C, while its boiling point is still not precisely defined. It is believed that it could be at around 5500 °C.

Such great hardness of osmium (7.0 on the Mohs scale), is perhaps one of its physical properties, which is responsible for it being so widely used. Osmium is introduced into the solid alloys with high wear resistance. Most expensive pen tips are made of osmium alloys with other metals, namely platinum or tungsten, and cobalt. These alloys normally compose small parts of precise measuring devices subject to wear. That is due to rather rare occurrence of osmium ($5x10^{-6}$ % by weight of Earth's crust), scattered and difficult to transport. The above explains the limited use of osmium in the industry. It is only with cost-efficient metal, some profit can be gained. For instance, in the chemical industry osmium is attempted to be employed as a catalyst. The hydrogenation reactions of organic substances are even more effective when catalyzed by osmium than platinum.

A few words about osmium position among other platinum metals. Externally it little differs from them, just in osmium highest melting and boiling points among all the metals in this group and its being most severe. It can be considered least "noble" of the platinum group metals, as it is oxidized by atmospheric oxygen even at room temperature (in the finely triturated state). However, osmium is the most expensive of all platinum metals. In 1966 in the world market platinum was valued 4.3 times as much as gold and iridium - 5.3, the same ratio for osmium was equal to 7.5.

Like other platinum metals, osmium exhibits several valences 0, 2+, 3+, 4+, 6+8+. Four-valence and hexavalent osmium compounds can be most frequently found. But it has a valence of 8+ when reacting with oxygen.

As with other platinum metals, osmium proves a good complexing agent, and the chemistry of osmium compounds is no less diverse than, say, that of palladium or ruthenium.

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Chemical weapon in the World War I (Химическое оружие в Первой мировой войне)

The First World War triggered the development of new types of weapons (for submarine fleet, aircraft, tanks, etc.).

However, one of them, chemical, for various reasons, was left on the sidelines of historical research. First applied in April 1915 for tactical benefits and being used for 4 years on the battlefields of the WW1, chemical weapons reached the level of development that made its use for operation purposes possible. In the evening of April 22, 1915 in the Belgian town of Ypres on the front 6 km long, the Germans released gas cylinders with about 180 tons of chlorine. As a result, Allies suffered heavy losses: 15 thousands people were poisoned by chlorine, at least 5 thousands were killed. The front was broken, the Ypres road was opened.

Over 50 types of toxic agents were used during the WW1. Besides chlorine, only a few substances were really effective.

PHOSGENE was first used by the French army in February of 21, 1916 in the battle of Verdun in 75-millimeter shells. In gaseous state

it is 3,5 times heavier than air. Due to the low boiling point it evaporates quickly after the shell's broken and in a few seconds it creates a deadly cloud of gas which covers the surface. Phosgene mixed with chlorine was very convenient for compressed gas attack.

DIPHOSGENE's toxic effect is similar to that of phosgene. However its boiling temperature (120 C) is higher than that of phosgene (82 C); its vapour is 7 times heavier than air, so it is not suitable for compressed gas attacks, so after the delivery to the target, the chemical shells with diphosgene retain their striking and chilling effect on the area for a longer time. Within three month in the battles in Shitankura the Germans successfully responded to French phosgene shells with their diphosgene mixed with chloropicrin.

MUSTARD GAS has a blister agent effect and was the most effective of all gases used during the WW1. Due to its skin-responsive effect, it can even go through a gas mask. Its droplets cause painful skin lesions, its vapor have a general toxic effect on eyes and lungs. Mustard gas permanently infects the area, restricting actions of the troops. It was first used by the Germans in 77- and 105-millimeter shells during the "Third Ypres" in July 13, 1917.

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Situation with processing of production waste and consumption waste in the Republic of Bashkortostan (Ситуация с переработкой отходов потребления и отходов производства в Республике Башкортостан)

The Republic of Bashkortostan is a region with a high concentration of industrial production, presented by refineries, petrochemical plants, energy and machine-building complex and a number of heavy industrial enterprises. The presence in the Republic Europe's largest complex of chemical and petrochemical industries as well as mining and engineering companies has led to serious environmental problems. Currently, due to the increasing volumes of waste disposal at landfills, the question of increasing the proportion of waste has become dramatical. Only a few tens of tons of waste are subject to recycling and reuse due to the weak economic interest of enterprises, low technological level of applied technologies, lack of funds and modern equipment. Therefore, the rate of their formation and accumulation remains very high.

Today in the republic 43 landfill for municipal solid waste (MSW) were put into operation, 37 of them were built with funds from the national budget. The total landfill area is 362.85 hectares, the total capacity is 331,1 million cubic meters.

In addition, 2580 MSW landfills operate in the republic, occupying a total area of over 2,000 hectares of land. The bulk of the landfill (70%) does not comply with environmental legislation (there are no major environmental facilities). The area occupied by unauthorized waste disposal sites greatly exceeds the area of legal landfills. Analysis of the locations of waste disposal sites (landfill MSW) showed that the bulk of them are rural MSW landfills.

To change this situation we can re-use many materials, which are contained in the waste, industrially (recycling).

For the development of small businesses in the Republic of Bashkortostan in the field of waste management there are the following favorable factors:

• the availability of adequate amounts of wastes;

• a huge public interest in waste management as a factor in environmental improvement;

The economic feasibility of the use of waste as a secondary raw material for production is high. For example, using 1 ton of waste paper saves 3.5 cubic meters of wood; 1 ton second polymeric raw material saves 7 tons of primary polymeric raw material; 1 ton of used tires saves 0.33 tons of synthetic rubber; 1 ton of recycled textile raw materials saves 0.7 tons of natural or synthetic fibers.

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The properties of emerald (Свойства изумруда)

Emerald is a transparent variety of beryl of green tones, sometimes with a bluish tint. Its dark green varieties are valued above diamonds. The Greeks called it "Shining Stone". In Russia emerald was considered to be the stone of wisdom, composure and hope.

The name "emerald" refers to the green variety of beryl, and "aquamarine" – to the variety of sea green. Another name for the emerald is "green ice".

The word "emerald" comes from the Persian word, which through such modified forms of Latin as «smaragdus» and «esmeralde», came to our times.

The modern form of the word emerald appeared in English only in the XVI century. Previously, it seems to be always used to denote minerals having green color. However, originally not only opaque mineral, but, possibly, non-transparent, but vividly colored minerals, such as chrysocolla, were called emeralds. This name was not attached to the green beryls as long as these stones were found in Upper Egypt. The main deposits of emerald are in Russia, Australia, Namibia, Norway, Africa, Pakistan.

The emerald has the following physical properties: a) the colour of emerald is usually caused by a small admixture of chromium. Many years ago V.M. Goldschmidt discovered that green Norwegian beryls contain more vanadium than chromium, and on the basis of this fact, came to the conclusion that trivalent vanadium can play the same role in beryl as chromium. Since then, vanadium has been found in emeralds from many deposits, and in the green beryl from Salininha in the Brazilian state of Bahia vanadium is accompanied by significant amount of iron and only traces of chromium; b) the density of Colombian and Siberian emeralds ranges from 2.68 to 2.74, but the average is 2,712. These high density values can be caused by the presence of alkali metals (cesium and rubidium); c) the emerald can be easily distinguished from all other stones of similar colour due to the clarity of the aqua green color. It is believed that the development of this stone continues even today, as it has not reached its full strength.

Since the material of pure emerald green color usually has a lot of flaws, the cut stones of good color and no defects weighing 5-6 carats are valued particularly highly. Pale emeralds are valued very low. Top quality items of emeralds are found in hydrothermal veins, which occur in the carbonate - carbonaceous shales. Mineral composition of inclusions, contained in emerald, determine the deposit this instance was mined from.

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Membrane Technology in Dairy Industry (Мембранные технологии в молочной промышленности)

Membrane technology – microfiltration, ultrafiltration, nanofiltration and reverse osmosis– is a process applied for the fractionation of fluids flowing under pressure using semi-porous polymeric or inorganic materials. Microfiltration and ultra filtration are of the most common methods.

Microfiltration is a membrane process which is the closest to normal filtration. It is based on the use of membranes which allow only certain components of a particular liquid or gas, excluding other undesirable elements from entering. It is used in such fields as long shelf life drinking milk production; milk preparation for cheese production; milk powder and whey powder production; cheese brine rehabilitation; milk proteins fractionation and others.

Ultra filtration is the method of separating fine particles from suspensions or colloidal solutions using pressure filtration. Small molecules, ions, and water are pressed through a semi permeable membrane.

The objectives of the ultra filtration are:

1. The pre-concentration of protein in the milk for the production of traditional cheeses;

2. Significant change in the relationship between proteins and other components to create new types of cheeses;

3. Normalization of milk protein to provide for uniformity and reproducibility of the properties of the resulting cheese, regardless of seasonality;

Membrane processes used in dairy industry include:

- Skim milk microfiltration
- Preparation of casein protein concentrates
- Production of ultra filtered cheeses
- Serum nanofiltration
- Concentration of milk
- Whey protein concentrates production
- Minor proteins of milk serum preparation
- Whey clarification

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The method of reducing the solubility of pectin films (О способе уменьшения растворимости пектиновых плёнок)

It is known that pectin and compounds on its basis are widely used in modern medicine due to its physiological activityrelated to the fact that it is a polyelectrolyte. For example, pectin films can be used as a means of burnstreatment. The main drawback of these films is the loss of integrity because of their solubility in the aquatic environment.

In this regard, the aim of this work was finding a way of reducing the solubility of pectin films in water, and producing the most stable film that retains its integrity.

The method of modification of films by treatment with acetic acid was chosen as an approach.

As the test object the films of pectin obtained by irrigation with

40 ml of 0.2 % solution on the surface of the Petri dish was chosen. The dissolution was carried out on a mechanical shaker for 6 hours. It is established that the formed film is dissolved in water for 40 minutes and on the wet gauze surface for over 4.5 hours.

With the aim of reducing the solubility of pectin films in water, the formed film was treated by concentrated acetic acid during different periods of time. Retention of the film in concentrated acetic acid had a positive effect on its stability in aqueous medium. As studies have shown, retention of pectin films in the acid determines the time of its dissolution: the longer a film is in the acid, the worse it is dissolved in water.



Pic.1 The graph of the time of complete dissolution of pectin films depending on the staying time of the film in concentrated acetic acid.

Thus, the experiments have revealed that exposure of pectin films stayed in glacial acetic acid for 1.5 hours resulted in a 2 times decrease in solubility of pectin films.

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Cosmic chemistry (Космическая химия)

Cosmochemistry is the study of the chemical composition of cosmic bodies, the laws of the prevalence and distribution of chemical elements in the Universe, the processes of combination and migration of atoms during the formation of cosmic matter. Cosmochemistry investigates predominantly "cold" processes at the level of molecular interactions of substances, while "hot" nuclear processes in space — plasma state of matter, nucleogenesis (the process of formation of chemical elements), inside stars, etc. — mainly involve physics. Cosmochemistry is a new area of knowledge that has received considerable development in the 2nd half of the 20th century, mainly due to the success of space exploration. Earlier studies of chemical processes in space and composition of celestial bodies was carried out mainly by spectral analysis of the radiation of the Sun, stars, and partly of the outer layers of atmospheres of planets. This method made it possible to access the element helium on the Sun before it was discovered on Earth.

The composition of the earth's crust includes: O - 46.6 %, Ca - 3.63 %, Al - 8.13 %, Na - 2.83 %, Si - 27.72 %, K - 2.59 %, Fe - 5.0 %, Mg - 2.0 %. In total these make up 98,59%

If you compare the iron, cobalt and nickel - elements adjacent in the eighth group of the periodic system – with others on the earth, it appears that the globe is composed of iron (atomic number 26; 36.9%), cobalt (atomic number 27;0.2%), nickel (atomic number 28; 2.9%).

Basic rock strata of the earth's crust consists of a few minerals; all these chemical compounds are located mainly in short periods during the beginning and the end of each of the long periods of the table. Prevalent among them are light elements with small numbers. These elements comprise the bulk of the silicate rocks.

Scientists have discovered that an iron meteorite is iron (91.0%), cobalt (0.6%), the nickel (8.4%).

Well-known stars are those with high silicon content (silicon stars), stars that have a lot of iron (iron stars), manganese (manganese),

carbon (carbon), etc. Stars with anomalous composition of the elements are quite diverse. In young stars like red giants an increased content of heavy elements was detected. In one of them an increased content of molybdenum was found, it is 26 times higher than its content in the Sun.

The chemical composition of the Universe is very diverse. Whatever visitor to the Earth you study – be it a part of a comet belonging to the solar system, or fragments of small planets – one thing is important: the chemical composition, the ratio between the elements in those chemical compounds which are found in meteorites tell us that the great law of Mendeleev is not limited by the boundaries our planet. It is common for the whole Universe. So we can conclude that matter is the same everywhere.

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Hydrocarbons (Углеводороды)

Hydrocarbons are organic compounds which molecules contain only carbon and hydrogen atoms.

The simplest representative is methane CH4. Hydrocarbons are the progenitors of all the other organic compounds, a great variety of which can be obtained by introducing functional groups in the hydrocarbon molecule; therefore organic chemistry is often defined as hydrocarbons and their derivatives.

Depending on the molecular weight hydrocarbons may be gaseous, liquid or solid substances. Compounds containing in the molecule up to four carbon atoms, under normal conditions are gases such as methane, ethane, propane, butane, isobutane. Liquid hydrocarbons are included in petroleum and petroleum products; they typically contain up to sixteen carbon atoms. The compositions of some wax, paraffin, asphalt, bitumen, tar include heavier hydrocarbons. Thus, in the composition include solid paraffin hydrocarbons having from 16 to 30 carbon atoms.

Hydrocarbons are divided into open-chain compounds - aliphatic, or non-cyclic compounds with a cyclic structure closed - alicyclic and aromatic. Aromatic hydrocarbons is isolated in a separate class because of the presence of a closed system of conjugate bonds they have specific properties.

These compounds are essential as a power source, since the main common feature of all - evolution of considerable heat during combustion. hydrocarbon mixtures used as fuel for thermal power plants and boilers, engines for cars, planes and other vehicles. When complete combustion of hydrocarbons produced water and carbon dioxide.

The hydrocarbons are used as precursors and intermediates in organic synthesis. In the chemical and petrochemical industry are used not only hydrocarbons of natural origin and synthetic. The methods are based on the latest processing of natural gas, oil, coal, and more recently biomass, in particular wastes of agriculture, wood processing and other industries.

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The polymer-colloid complexes of Na - carboxymethyl cellulose and micelles of lyophobic sols (Полимер-коллоидные комплексы Naкарбоксиметилцеллюлозы с мицеллами лиофобных золей)

Polymeric complexes (PC) are increasingly used as thickeners and suspension stabilizers, film formers for capsules and tablets, as well as a basis for ointments and other soft dosage forms. Derivatives and complexes based on Na-carboxymethyl cellulose (CMC - Na) may act as such polymers. One approach to creating stable nanostructured dispersed systems with adjustable sizes can use the ability of macromolecules to self-assemble by non-covalent intermolecular association through communication. For example, these can be polymer-colloid complexes (PCC) of CMC - Na with inorganic colloidal particles of lyophobic sols (in the work it's silver iodide sol).

We used samples of CMC - Na (St. Petersburg, JSC "Vekton"). AgI sols with negatively and positively charged micelles obtained by the standard technique from the solution $AgNO_3$ (0.01 mol/l) and the solution KI (0.01 mol/l) in a volumetric ratio of 10:5 and 5:10. The disperse systems based on PCC CMC - Na with colloidal particles of AgI obtained by mixing an aqueous solution of CMC - Na with concentration of 0.2% with freshly prepared AgI sols. According to the method of turbidity spectrum the particles sizes of CMC - Na with a negative AgI sol are 69 - 125 nm.

When adding to a CMC - Na solution of the AgI sol with negatively charged micelles we can see an increase in optical density values of the polymer-colloidal dispersion (Fig.1). Apparently this is due to the fact that the value of the optical density D = 0,09 of the sol is higher than the optical density of the CMC-Na solution (D = 0,006). Figure 2 shows that insoluble complexes are formed by mixing CMC - Na with positively charged AgI sol micelles at any ratio of initial components. There has been a sharp increase in the optical density.

It was found that when using as polymer tread the AgI sol particles of polyelectrolyte CMC - Na significant contribution to the formation of the PCC is made by the specific adsorption and the electrostatic interaction of ionized functional groups of the polymer with charged particles of silver iodide sol.



Fig.1. The dependence of the optical density of the aqueous dispersions CMC-Na -AgI⁻ sol on the volume ratio of the starting components of the mixture (Z), wavelength 540 nm, the initial concentration CMC -Na 0,2% by weight.

Fig.2. The dependence of the optical density of aqueous dispersions CMC-Na - AgI^+ sol on the volume ratio of the starting components of the mixture (Z), wavelength 540 nm, the initial concentration CMC – Na 0,2% by weight.

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Entdeckung der Fullerene (Открытие фуллеренов)

Die Entdeckung der Fullerene - einer neuen Form der Existenz des Kohlenstoffs ist als eine der wichtigsten Entdeckungen in der Wissenschaft des XX. Jahrhunderts anerkannt. Trotz der seit langem bekannte einzigartige Fähigkeit Kohlenstoffatomen kommunizieren in Komplexen, oft verzweigt und dreidimensionale molekulare Struktur, die die Grundlage des gesamten organischen Chemie, die tatsächliche Möglichkeit der Bildung nur aus einem einzigen stabilen Kohlenstoff-Skelett-Moleküle dennoch zeigte sich unerwartet. Die experimentelle Bestätigung der Tatsache, dass Moleküle dieser Art, bestehend aus 60 Atomen, entstehen im Laufe der natürlichen Prozesse in der Natur, das geschah 1985. Eine neue Phase trat im Jahr 1990, als es wurde die Methode der Gewinnung neuer Verbindungen und die Methode der Herstellung von Fullerenen in seiner reinsten Form. Sehr bald wurden dann die wichtigsten strukturellen und physikalisch-chemischen Eigenschaften der Fullerene C_{60} - am leichtesten aus der Verbindung unter den bekannten Fullerenen definiert. Für seine Entdeckung - die Entdeckung der Kohlenstoff-Cluster der Zusammensetzung C_{60} -und C_{70} - R. Curl, R. und G. Smalley Kroto 1996 erhielten den Nobelpreis für Chemie. Von ihnen wurde und die Struktur der Fullerene C_{60} angeboten.

Bis vor kurzem hat es immer wieder in Erstaunen die Wissenschaftler wegen seiner extrem niedrigen Toxizität und anderer erstaunlichen Eigenschaften gesetzt. Die Mechanismen der Wechselwirkung von Fullerenen mit den Zellen noch nicht klar, aber das Ergebnis ist wirklich Magie nennen kann. Das C₆₀-Molekül mit seiner kugelförmigen Gestalt und den 30 Doppelbindungen bietet als Ausgangsstoff zahlreiche Möglichkeiten, um spezielle Molekülformen zu synthetisieren. Man ist bereits heute in der Lage, Derivate mit definierter räumlicher Struktur und Funktionalität zu erzeugen. Solche hochspezifischen Systeme können im Bereich der molekularen Erkennung eingesetzt werden. Ein C_{60} -Derivat ist z. B. in der Lage, die Vermehrung des HIV-Virus (AIDS-Virus) zu hemmen. Es kann die aktive Stelle des HIV-Protease-Enzyms "erkennen" und sich dort anlagern. Dadurch blockiert es das Enzym, das nun seine ursprüngliche Aufgabe nicht mehr wahrnehmen kann. Da dieses Enzym für die Vermehrung des Virus wichtig ist, ist damit auch die Erzeugung neuer Viren unterbunden. Bisher wurden diese Versuche nur in vitro, das heißt im Reagenzglas durchgeführt. Diese Forschungen könnten zur Gewinnung eines wirksamen Mittels gegen AIDS beitragen.

Fulleren und seine Derivate können zum Schutz des Körpers vor Strahlung und UV-Strahlung, zum Schutz vor Viren und Bakterien, zum Schutz vor Allergien verwendet werden. Die antioxidative Wirkung der Fullerene ist mit der Wirkung der Antioxidantien Klasse SkQ vergleichbar und in 100-1000 mal höher als die Wirkung von herkömmlichen Anti-Oxidanten.

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Fluoride toothpastes - benefit or harm? (Содержащие фториды зубные пасты – польза или вред?)

Fluorine is a seventh group element of the second period of the periodic table, with atomic number 9. It is the lightest element from the group of halogens. Simple fluorine under normal conditions is a diatomic gas (formula F_2) of pale-yellow color with a pungent smell. It is an extremely active nonmetal and most powerful oxidant. Only three light inert gases from all elements do not form fluorides, because they do not react with fluorine - helium, neon and argon. All fluorine compounds show only one oxidation state, that of -1.

Fluorides are chemical compounds with other elements. Fluorides of most metals (hydrofluoric acid salt) are crystals with high melting point, nonmetal fluorides make liquids or gases.

Fluorides are widely used in industry: they are the main sources of free fluorine. Also fluorides are employed as oxidants in rocket propellants, for uranium isotope separation, for the production of optical glass, for fluorination of organic and inorganic compounds. And they are sure to be found in dentistry.

Fluoride toothpaste has been applied for about 100 years. Fluoride is believed to be toxic to the bacteria. Bacteria, like all living forms, must feed. It uses sugar (glucose, sucrose, fructose, lactose or food starches) and bacteria wastes as food, which can dissolve tooth enamel and cause tooth demineralization or caries. Fluoride poisons bacteria and reduces their ability to process sugar. Unfortunately, fluoride is toxic, and not only bacteria but other cells are also poisoned.

Fluorine is a natural element that is part of the Earth's crust. Therefore, it is evident that a small dose of fluorine is contained in natural water. Plants absorb fluorine from water and land, and a small amount of this substance is contained in all of our food and water. As trace element fluorine is included in all organisms. In animals and humans fluorine is contained in bone tissue, especially in the dentin and tooth enamel. The body of an average person consists of 2,6 g of fluo-

rine; daily requirement is 2-3 mg, mainly met by drinking water. The lack of fluorine leads to dental caries.

Despite the fact of fluorine occurring in nature, it is toxic to humans. Fluoride toothpaste contains a much higher concentration compared with the content of that in nature. Excess fluorine leads to fluorosis, i.e. a change in the structure of the enamel and bone, resulting in bone deformities. In addition, numerous studies have confirmed the fact that fluorine and its compounds do harm to brain cells due to toxic effects.

Therefore it is better to choose a toothpaste without fluoride, particularly in those areas where water is composed of fluorine compounds. Products with increased calcium concentration are a great alternative to any fluoride-contained toothpaste. With modern compositions enriched with specific substances, calcium is able to work on the surface of the enamel in the same manner as fluorine.

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Chemical Company Clariant (Химическая компания Клариант)

Clariant company was formed in 1995 on the basis of the chemical company Sandoz in Basel (Switzerland) in 1886. Thus, this «family tree» has been giving the opportunity to gain experience and knowledge in the field of chemical production for about 130 years. In 1997, the company Clariant grew due to the acquisition of a part of the business of the German company Hoechst, which started its activity in Russia in the 19th century.

In 1878 'young' chemical company Farbwerke (future Hoechst AG) opened its first venture outside of Germany in Russia. Here dyes for textiles were produces; raw materials for them being brought from Frankfurt. After nationalization in 1918 the joint-stock company Farbwerke was renamed into the Derbenevskij chemical plant with the staff of about 600 people.

In 1971 Hoechst AG was one of the first companies that opened its representative office in Moscow in the Soviet period. After 1997, when the Clariant company acquired the Hoechst business, the regional office became a part of regional subdivision of Clariant in Russia. In 2011 the business of several chemical companies was purchased, including the chemical branch of the company Süd-Chemie.

In the years of its activity in the region the company Clariant acquired two industrial enterprises: a catalyst manufacturing plant in Severodonetsk (Ukraine), owned by Süd-Chemie and a masterbatch production plant in Nizhnekamsk (Tatarstan, Russia).

Nowadays Clariant personnel in Russia and CIS have about 300 people working in Moscow, Minsk, Kiev, Almaty, Severodonetsk, Nizhnekamsk, St. Petersburg, Moscow, Kazan, Nizhnevartovsk, Ashgabat, the company has an extensive network of offices, laboratories and representatives. They also have distributors and local industrial partners that contribute in supplying and manufacturing definite products in demand within the industry.

Clariant carries out deliveries of chemical products and solutions that are used in various industries: oil industry, mining industry, catalysts for chemical production. In addition, the company manufactures and sells pigments, additives and masterbatches for manufacturing of plastics and coatings, as well as special chemicals for industry and production of consumer goods.

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Platinum (Платина)

Chemistry studies a large number of metals. They include both simple and precious metals. The most expensive metal is platinum.

Platinum is one of the most valuable precious metals, it has a number of important properties due to which it is not only used in the jewelry industry, but also in many other industries. The use of platinum in chemical technology makes it relevant to a deeper study of its physical and chemical properties.

The name of platinum has been given by Spanish conquistadors, in the middle of the XVII century. They saw the new metal that looks like silver for the first time in South America. The word literally means "little silver". It was contemptuous name for exceptional refractoriness of platinum, which was not used for long time and was valued twice lower than silver.

Platinum is a precious refractory grayish-white lustrous metal. It is considered the most solid, durable and expensive metal nowadays. This metal is hypoallergenic and is compatible with any type of skin. Gold and silver can cause allergic reactions. It hardly undergoes deformation and mechanical shock, doesn't tarnish or oxidize in air and water.

Jewelry made of platinum is valued more expensive than those made of pure gold, as platinum is a very rare metal. Annually they produce only 173 tons of platinum as compared to 2300 t of gold in the world.

The chemistry of platinum is very complicated, complex and interesting. Perhaps the most common property of its compounds is a narrow temperature range of stability associated with high polarizing effect of platinum and developing its compounds by heating the additional effect of polarization, resulting in the destruction of chemical bonds and the recovery of metallic platinum status.

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Reduction - oxidation reactions (Окислительно-восстановительные реакции)

One of the basic concepts in chemistry is the concept of the degree of oxidation. The degree of oxidation of the element in a compound is atom's formal charge calculated based on the assumption that the valence electrons are transferred to the atoms with greater relative electronegativity and all the linking in the molecule are ionic compounds. The degree of oxidation of ions, actually existing in solution or crystals, is the same as the charge number and similarly and is marked with the sign "+" or "-" after the number, for example Cl^- , Ca^{2+} . The sign of the degree of oxidation of atoms in the molecule is founded on the comparison of the electronegativities of the atoms, which form a molecule. In this case atom with less electronegativity has a positive oxidation degree, and atom with greater electronegativity has negative.

Oxidation degree is a notional value, which usually describes reduction-oxidation reactions. In the oxidation-reduction reactions two interconnected processes take place: oxidation and reduction. Substances, atoms or ions that donate electrons are called the reducing agents; process of releasing electrons is called oxidation. Thus, reducing agents are oxidized in the reduction-oxidation reactions. Substances, ions or atoms which draw electrons are called oxidants; electron attachment process is called reduction. Oxidants in reduction-oxidation reactions restore. Substances that contain atoms in the intermediate oxidation state can be both reducing agents and oxidizers. Such substances exhibit double characteristics.

Thus, it is possible to give a definition: reduction-oxidation reactions are called reactions occurring with the change in the oxidation state of atoms of elements belonging to the reactants.

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Platinum as the most resistant metal (Платина как самый резистентный метал)

Platinum is a grayish-white plastic metal, temperatures of melting and boiling -1769 °C and 3800 °C respectively. This metal being even more rare, than gold, is also more expensive than the latter. Platinum metal is sometimes called "the most noble".

In the history of science the discovery of platinum has left a bright mark, having undermined belief in the most sacred - genuineness of gold, with alchemy discredited. Business wasn't limited to such negative results. Further studying of platinum metals not has only expanded opportunities of their practical application, but has also led to several really great findings. In 1823 when properties of platinum already considered well studied, the German chemist I. Dyoberevner has shown experiment which looked as focus and has aroused the general mistrust. Dyobereyner letting out a hydrogen stream from a vessel, placed fine (spongy) platinum on its way, and that hour hydrogen lit up by itself at the room temperature and even in the frost. The experiment was repeated by many others and they were made convinced – there is no dirty trick. No matter how many times wouldn't ignite a stream so many times hydrogen burned, platinum at contact with it remains invariable, keeping the weight, looks and properties. Therefore, the former doesn't participate in reaction.

Believe that pure platinum was first received by Englishman Watson in 1750. In 1752 after Schäffer's research it has been recognized as a new element. Platinum can be considered as a typical element of the VIIth group. This metal possesses big viscosity and good conductivity that reasonably getting it referred to category of noble. Platinum is applied in equipment, medicine, in jewelry and other fields of society. A conclusion about this metal is based on the fact that this precious metal due to its properties has broad application. One of organizers of the Soviet platinum industry, professor Orest Yevgenyevich Zvyagintsev, compared value of platinum to that of salt when cooking – a little is necessary, but without it a lunch can not be made ...

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Organometallic chemistry (Органометаллическая химия)

Organometallic chemistry is the study of compounds containing, and reactions involving, metal-carbon bonds. The metal-carbon bond may be transient or temporary, but if one exists during a reaction or in a compound of interest, we're in the domain of organometallic chemistry. Despite the denotational importance of the M-C bond, bonds between metals and the other common elements of organic chemistry also appear in OM chemistry: metal-nitrogen, metal-oxygen, metal-halogen, and even metal-hydrogen bonds all play a role.

Organometallic compounds have at least one carbon to metal bond, according to most definitions. This bond can be either a direct carbon to metal bond (σ bond) or a metal complex bond (π bond). Compounds containing metal to hydrogen bonds as well as some compounds containing nonmetallic (metalloid) elements bonded to carbon are sometimes included in this class of compounds. Some common properties of organometallic compounds are relatively low melting points, insolubility in water, solubility in ether and related solvents, toxicity, oxidizability, and high reactivity.

The first reported organometallic compounds were prepared by the reductive substitution of alkyl halides. All these metals have strong or moderate negative reduction potentials, with lithium and magnesium being the most reactive. Halide reactivity increases in the order: Cl < Br < I. Al-kyl sodium and potassium compounds are not made in this way because Wurtz coupling of the alkyl moiety (giving R-R) tends to predominate.

- $R-X + Zn \longrightarrow R-Zn-X$
- $R-X + Mg \longrightarrow R-Mg-X$
- $R-X + 2Li \longrightarrow R-Li + LiX$

Organometallic compounds are very useful as catalysts or reagents in the synthesis of organic compounds, such as pharmaceutical products. One of the major advantages of organometallic compounds is their high reactivity. Reactions that cannot be carried out with the usual types of organic reagents can sometimes be easily carried out using one of a wide variety of available organometallics. A second advantage is the high reaction selectivity that is often achieved via the use of organometallic catalysts. A third advantage is that many in this wide range of compounds are stable, and many of these have found uses as medicinals and pesticides. A fourth advantage is the case of recovery of pure metals. Isolation of a pure sample of an organometallic compound containing a desired metal can be readily accomplished, and the pure metal can then be easily obtained from the compound.

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Nuclear reactions (Ядерные реакции)

Nuclear reactions mean the interaction of the particles with the nuclei of chemical elements. The first artificial nuclear transmutation was accomplished in 1919 by E. Rutherford.

Crucial role in the development of nuclear chemistry played the opening in 1939 of the fission process of uranium nuclei by neutron bombardment.

In fission the nucleus splits into two new highly radioactive nuclei with different masses. Fission of a nucleus is accompanied by the release of huge amounts of energy.

In the fission reactions in spent one neutron is formed 2-3 new neutrons, which can trigger a reaction of nuclear fission. Thus, there may be increase in the number of fissionable nuclei, i.e. the so-called chain reaction could start.

Controlled reaction of fission is used in nuclear reactors, with energy produced and radioactive isotopes of other elements obtained.

Other important types of nuclear reactions are termed *fusion* reactions. They appear to be the fusion reactions of small nuclei into more complex and massive ones.

Research into the regularities of nuclear transformations is important for establishing the nature of nuclear forces and the postulating the theory of the nuclear structure, the study of nuclear reactions of great practical value resulting in nuclear energy and artificially obtaining new chemical elements. The development of technology of particle acceleration has allowed to perform the processes of approaching to what is happening in the earth's crust and outer space in the laboratory. The regularities of nuclear reactions having been studied, theory of the origin of the chemical elements and their prevalence in nature can be proposed. According to nuclear physicists, synthesis and transmutation of elements occur at all stages of stellar evolution as a natural process of their development.

The formation of nuclei with the increasing complexity of their composition can happen in nature via the merger of the charged parti-

cles with each other. At temperatures of 10-20 m K $^{\circ}$ in stars the reactions of transformation of hydrogen into helium are regular and common. This reaction can be the basic source of those supporting the Sun and most stars in the hot condition. The formation of the heavy elements occurs in the explosion of stars.

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SWM Ausbauoffensive Erneuerbare Energien (Возобновляемые источники энергии коммунального хозяйства Мюнхена)

Der Klimawandel ist eine der größten Herausforderungen unserer Zeit. Er hat nicht nur gewaltige ökologische Folgen(Abschmelzen der Polkappen und Gletscher, steigende Meeresspiegel, vermehrte Wetterextreme etc.), sondern auch ökonomische (um die Schäden zu beheben, sind riesige Summen nötig) und gesellschaftliche. Er wird sogar als Bedrohung für den Weltfrieden gesehen. Klimaschutz und ein nachhaltiger Umgang mit den natürlichen Ressourcen gehören daher zu den wichtigen Aufgaben unserer Zeit. Die Stadt München hat die Zeichen erkannt. Mit Hilfe der SWM, ihres kommunalen Unternehmens, nimmt sie eine Vorreiterrolle ein und setzt sich an die Spitze bei Klima- und Umweltschutz. Neben Wasser, Geothermie, Sonne und Biomasse spielt die Windkraft die zentrale Rolle in der SWM Strategie. Sie ist die kosteneffizienteste unter den erneuerbaren Energien.

Onschore-Windparks in Deutschland. Die SWM betreiben in Deutschland in verschiedenen Parks über 100 Onschore - Windkraftanlagen. Ihr Anteil von 236 Millionen kWh pro Jahr entspricht dem Jahresverbrauch von rund 95.000 Münchner Haushalten. Darüber hinaus besitzen sie Onschore-Windparks in Nordrhein-Westfalen, Rheinland-Pfalz, Sachsen-Anhalt und nochmals Brandenburg mit 25 Windkraftanlagen. Diese erzeugen jährlich ca. 100 Millionen kWh Ökostrom. Das entspricht dem Jahresverbrauch von 40.000 Münchner Haushalten. **Offschore-Windparks in der Nordsee**. Der SWM Anteil am Projekt (49 Prozent) entspricht dem Jahresstrombedarf von ca. 250.000 Münchner Haushalten. Etwa 90 Kilometer vor Sylt entsteht der Schwesterwindpark Sandbank. In der Nordsee, rund 180 Kilometer vor Bremerhaven, liegt der Offschore Windpark Global Tech I.

Solarparks in Deutschland. Der SWM Anteil (40 %) entspricht dem Strombedarf von 3.200 Münchner Haushalten. Die Dünnschicht-Solaranlage in Lauingen / Donau produziert mit 10 Megawatt Leistung Ökostrom.

Wasserkraftwerke an der Münchner Isar. Es erzeugt 10 Millionen kWh Ökostrom pro Jahr, genug für 4.000 Münchner Haushalte. Zudem modernisieren die SWM bestehende Wasserkraftwerke an der Isar, die so mehr Ökostrom erzeugen und noch mehr Kohlendioxid einsparen können.

Mit M-Ökostrom selbst zum Klimaschutz beitragen. Sehr erfreulich, immer mehr Münchnerinnen und Münchner tun dies und treiben damit die Umweltschutzaktivitäten der SWM voran. Aber auch viele Gewerbe und Geschäftskunden sind auf Ökostrom umgestiegen.

Wer sich darüber hinaus für M-Ökostrom aktiv entscheidet, leistet mit einem freiwilligen Aufpreis seinen eigenen Beitrag zum Ausbau der Erneuerbaren in und um München.

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Deformation - mechanical properties of plasticized chitosan films (Деформационно-прочностные свойства пластифицированных хитозановых пленок)

Nowadays one of the important directions of combustiology is providing effective coating for wounds and burns. [1] According to the literature and patent information the films made of biocompatible synthetic or natural polymers and their compositions are most suitable for this purpose among the variety of protective coverings. Chitosan polymer (HTZ) derived from the biopolymer chitin combines a wide variety of properties. First of all, HTZ is non-toxic. Secondly, it is biocompatible with the tissues of living organisms. Furthermore, it has bacteriostatic properties and highly effective sorbent. [2]. On the other hand, the deformation-strength properties of films and film materials made of HTZ are not satisfactory. HTZ films are fragile, which makes their application in regenerative medicine difficult and decreases the therapeutic effect. In this context, the aim of this work was to study the possibility of plasticizing chitosan films in order to improve their deformation and strength characteristics.

The solvent of HTZ was 1% acetic acid. HTZ concentration in solution was 2% by weight. The glycerin as plasticizer was chosen in this study, it was introduced into the film during the cooking process in the amount of 10-50% by weight relative to the HTZ weight. The film has been formed on the surface of the petri dish and the thickness was 0.1 mm. Elongation at break (ϵ) was calculated on the basis of the original length of the film sample taken for testing and expressed as a percentage. The values of elongation at break were counted as the average of 3 parallel measurements.

According to the conducted experiments on HTZ film samples the addition of glycerol in the preparation of films makes it possible to greatly increase the elasticity of the film samples. If the original HTZ film containing no glycerol was characterized by the value of the elongation at break $\varepsilon = 7\%$, the film containing 50% glycerol by weight of HTZ has a value of $\varepsilon = 50\%$.

Thus, by varying the concentration of glycerol in the film it is possible to substantially improve its elasticity.

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POLYMERISATION (Полимеризация)

Für Polymerisationen werden oft Äthen oder Verbindungen eingesetzt, die sich vom Äthen ableiten (Vinylverbindungen). Wichtige Ausgangsstoffe für Polymerisationen sind Äthen (Äthylen), Vinylbenzol (Styrol), Vinylacetat, Athylenoxid, Tetrafluorathen, Vinylcyanid. Polymerisationen können auch als Kopolymerisation durchgeführt werden.

Unter einer Kopolymerisation versteht man eine Polymerisation von mindestens zwei verschiedenen Monomeren, wobei Makromoleküle entstehen, die die unterschiedlichen Monomermoleküle als miteinander verknüpfte Grundbausteine enthalten.

Durch Kopolymerisation entstehen makromolekulare Stoffe, deren Eigenschaften weitgehend speziellen Einsatzgebieten angepaßt werden können.

Polymerisationen können ionisch und radikalisch verlaufen. Vielen technisch wichtigen Polymerisationen liegt ein Radikalkettenmechanismus zugrunde. Die Polymerisationen sind Kettenreaktionen. Man unterteilt den Ablauf von Kettenreaktionen in Kettenstart, Kettenwachstum und Kettenabbruch. Durch Energiezufuhr wird die Polymerisation "gestartet". Einzelne Monomere werden aktiviert. Das kann mittels Wärme- oder Lichtenergie erfolgen, oft wird auch chemische Energie genutzt. Spezielle Katalysatoren Aluminiumchlorid, Borfluorid, Alkalimetalle starten "Ionenpolymerisationen". Organische Peroxide und andere Verbindungen leiten "Radikalpolymerisationen" ein. Sie bilden "Initiatorradikale", von denen die Polymerisation ausgeht.

An den wenigen beim Kettenstart entstandenen aktivierten Monomeren lagern sich Monomermoleküle unter Aufspaltung der π -Bindungen und unter Ausbildung von σ -Bindungen (exotherme Reaktionen) an. Polymerisationen verlaufen immer exotherm. Es entstehen Ketten, deren Länge von den äußeren Bedingunen (Temperatur, Druck, Durchmischung, Art und Menge des zugesetzten Katalysators) und auch von der Art der Monomeren abhängt. Kettenbruch tritt ein, wenn die aktiven makromolekularen Radikale in inaktive Makromoleküle mit stabilem Zustand übergehen. Der Kettenbruch erfolgt durch verschiedene Reaktionen.

Mit den gesteuerten und freiwillig eintretenden Abbruchreaktionen ist die Polymerisation beendet.

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Peroxide compounds (Соединения пероксида)

Peroxide Compounds is a class of chemical compounds that contain oxygen atoms directly bound to each other.

The simplest and most important widespread inorganic peroxide is hydrogen peroxide (H₂O₂). The crystalline lattice of inorganic peroxide-type compounds consists of metal ions in combination with one of the molecular oxyanions, Q_2^{2-} , O_2^{-} , or O_3^{-} . According to which of these anions is present, a distinction is made between peroxides, which contain the anion Q_2^{2-} ; superoxides, with the anion $O_2^{-"}$; and ozonides, with the anion O_3^{--} .

Peroxides and superoxides of metals are salts of the weak acids, hydrogen peroxide (H_2O_2) and hydrogen superoxide (HO_2) , respectively. Hydrogen superoxide is an active species that rapidly rearranges to give H_2O_2 and O_2 at normal temperatures. It is an intermediate of most combustion reactions and oxidations by oxygen and H_2O_2 . The action of ozone (O_3) on hydroxides or superoxides gives ozonides of alkali metals, with the formula MO_3 (where M represents any alkali metal), for example, KO_3 .

The peroxy group, —O—O—, is found in peroxy acids, or peracids, and in binuclear complexes. Examples are the peroxy-sulfuric acids, peroxymonosulfuric acid (HOSO₂—OOH) and peroxydisulfuric acid (HOSO₂—O—O—SO₂OH). Analogous peroxy derivatives are known for carbonic acid and several other acids. These compounds are

obtained either by electrolysis of the common acids or by the reaction of concentrated acids and H_2O_2 .

Peroxide-type compounds are used in industry as oxidizing agents, bleaching agents, and convenient sources of oxygen for reconstituting air in a process that is equivalent to converting CO_2 into O_2 . © Япарова Алия, 2016

ЭКОНОМИЧЕСКИЕ НАУКИ

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Internet trading in Russia (Интернет торговля в России)

The citizens of the USSR could become acquainted with trading only through the American films, and the habitants of Russia can independently become traders. What is the Internet trading?

When we talk about Internet trading or even exchange trade, we mean by this execution of operations on the stock exchange.We expose the application for purchase or sale shares (bonds, urgent instruments) which arrives and is carried out at the exchange at the specified prices. It is the exchange market, exchange trade. Any your transaction has confirmation in a single exchange register.You will find there exactly your transaction, with your volume, your price and time within seconds.Thus, all professional participants of the securities market of Russia are not only licensed, but also their activity is tightly controlled by the Federal service for financial markets (FSFM).

The advantages of Internet trading are low costs, high tariff competitiveness, availability, high speed of transactions. However, there are also some disadvantages. Some of these disadvantages are institutional risks, relatively weak security from technical failures and attacks of hackers.

The main impetus to development of Internet trading in Russia has been given during the crisis of 1998. The western participants plus our professional participants, some legal entities on which accounts there were rather serious sums were the main participants of stock market before crisis. At that time it was necessary to have not less than \$200 thousand on the accountto become the client of the large broker. The crisis has painfully struck all, clients with such sums became much less.

At the same time, at the exchange there was a technology by which brokers could connect to it via a special gateway and could connect the clients who on the Internet in real time could expose applications and conclude bargains directly at the exchange.Gateways for Internet trading has become available and for other exchanges. Thanks to this technology cost of customer service by broker companies has sharply decreased, commissions decreased and the amount of the account with which you can start trading.

The main feature of the Russian market compared to West is that our market is more understandable, therefore, investment and speculation on it bring more revenue than in the West. This is primarily due to a small selection of tools for trading, own shares of stock. If we have several hundred shares, then in the West there are a few thousands.

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Concept of financial system (Понятие финансовая система)

The financial system as a whole is a collection of different spheres of financial relations, during which various monetary funds are generated and used, i.e. E. Finance functions are implemented, the financial system is composed of subsystems [3].

A subsystem is a major component of complex systems, which are usually, in turn, are complex systems. As a subsystem of the financial system may be considered: treasury system, stock market, finance, stock market, insurance and so on.

The structure of the financial system is a combination of elements and the relationships between them. State financial system of the developed capitalist countries, includes 4 units (subsystems):

1) The state budget - the state financial plan for the current year, which has the force of law, approved by Parliament;
2) Local finance - local budget, municipal securities, owned by local governments, and other financial assets;

3) Special non-budgetary funds (social and economic);

4) The finances of public corporations [1].

The essence of the financial system depends on the nature of distributive and redistributive relations on the motion amounts of financial resources. The financial system of the state is a reflection of forms and methods for the specific use of finance in the economy and in accordance models in the economy are largely determined by it [2].

Financial flows are the manifestation of value in the form of permanent, stable relationships of economic entities, government, households and non-governmental organizations about the production, distribution, exchange and consumption of resources, goods and services.

Thus, the financial system is an important part of the global economy, each area of the financial system in their diverse contributes to the economy.

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Motivational mechanism as the factor of increase of production operation efficiency (Мотивационный механизм, как фактор повышения эффективности производственной деятельности)

The problem of motivation is one of the most important things in staff management, the value of which is growing more and more in the changing content and working conditions. The motivation to work and the status of organizational culture are significant factors of success in any organization.

The work motivation is very important in labor activity of the person. It defines the human response to the nature, content, organization, promotion conditions, with the aim of achieving the necessary results.

Motivation is usually defined as the process of encouraging yourself and others to work to achieve personal goals and objectives, i.e. it is an internal process of conscious choice of this or that type of behavior determined by complex influence of external (incentives) and internal (motives) factors.

The process of motivation can be divided into the following stages: the identification of needs, formation and development of motives, incentive management in order to change people's behavior necessary to achieve the goals, the adjustment of the motivational process depending on the degree of achievement. Stimulation methods can be divided into the following four types: economic incentives, management by objectives, job enrichment, and participation system.

The results of our research showed that the most important factor in the system of staff motivation is the remunerate on system. But the constant increase of the remuneration level contributes neither maintenance of labour activity at the proper level nor increase of labour efficiency. It was found out that the application of this method can be useful for achieving short-term increase in labor efficiency. Unilateral effect on workers only by cash basis methods cannot lead to long- termin crease in labor efficiency.

So we arrived at a conclusion that it is necessary to create nonmaterial methods of motivation – equipped recreational space, personal work area, comfortable environment, corporate events, discounts on services or products to the company, encouragement of best employees, etc.

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Salt tax (Соляной налог)

In the XV century trade markets in Russia was complicated by numerous kinds of fees, salt selling was most difficult from which princes and merchants tried to extract the maximum profit.

At the beginning of the XII century salt-pans were levied duty. Delivered salt was also dutiable in favor of the state treasury. In the XVI century the authorities tried to organize a system of levies and taxes, but in fact they even increased them more. They started to charge duty from the salt merchants, as well as from customers. All these numerous charges complicated trade and contributed to the growth of prices for salt.

In the middle of XVII Treasury was empty so the government of Tsar Alexei Mikhailovich the Quietest declared introduction of indirect taxes. There was an increase in indirect taxes by raising the price of salt by 4 times. As a result of the king's decree the price of salt has increased so much that the population has not been able to buy it in the required quantity.

Resentment over the salt tax was so fierce that it was decided to abandon it in December 1647, but at the same time he developed a decree on the restoration of the collection of the other two major taxes that have been abolished. Moreover, all these taxes needed to be collected for all 3 years.

In 1648 social unrest in Moscow reached its peak, which led to the "Salt Riot."

By the end of the XVII century salt industry has acquired the status of one of the largest sectors of Russian industry. But there was lack of salt in the country, which was supplied from abroad. In 1705 Peter I introduced the state monopoly on salt, increased and improved the salt industry in the country. Trading salt brought to the treasury a lot of money. Since that time the monopolization of the salt market prices of salt rose.

At the beginning of the XIX century there was a drop in the price of salt and in 1818 the salt tax was introduced again. This tax in Russia was not the same for different areas and depended on salt production location. It ranged from 8 to 30 kopecks for pood and thereby establishes a balance in the different cost of salt production in the various regions of the Russian Empire. Selling salt was allowed everywhere. However, there was salt, the sale of which could be carried out only in state-owned shops at government price, as well as salt for the free sale on condition payment of tax.

In 1881, the tax on salt was abolished, so a few salt-pans had to stop work on the production. But the rejection of the tax was an effective incentive to increase the production of salt in other places.

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Philosophical aspects of modern economy in the field of communication innovations (Философские аспекты современной экономики в области инноваций связи)

Formed in the world in the second half of the twentieth century, economic infrastructure, which is usually defined as innovative and unique, also gave rise to the direction of communication: between the scientific community, business and government. Our main task is to create effective communication: to remove contradictions, to create a basis of mutual understanding.

PR (Public Relations) is a deliberate, planned and sustained effort, with the goal to establish and maintain mutual understanding between an organization and its public. Communication in the field of innovation as an independent branch of PR-activity emerged in the late 2000s was based on the innovative journalism. Conceptual basis is to try to stimulate the media through the right approach to play a leading role in highlighting and promote innovation for the general public and communication in science, whose task is to support the production of knowledge and its implementation in the economic system and the promotion of innovative products. Currently aspects of communication in the field of innovation are developed in some countries of the European Union (Slovenia, Sweden, Finland and Germany) and the United States. In Russia, the first steps in this direction are understanding of communication in the field of innovation as in the process of formation.

K. Mast, S. and A. Hak Zefrass define the term as a symbolic interaction between organizations and their stakeholders that occurs around new products, services and technologies. A new type of communication that brings together communities that are not always in the line of communication. Communication objects are becoming harder and smarter, therefore, more complex are the challenges facing them. Meanwhile, the main purpose of communication in the field of innovation is to organize dialogue between all participants in the innovation space, promotion of innovation as a key competitive factor for sustainable development of the state and society. The first group focused on organizing activities to promote creative thinking and the spirit of innovation. The second group of problems solves the problem of formation of innovative personnel. The third group of problems relates to the use of modern systems and tools for the development of innovative processes in organizations and provide support for research activities of all stakeholders of the intellectual sphere. In conclusion, it should be noted that despite the action taken, the system of communication in the field of innovation in our country is in its infancy and therefore is not effective.

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ЮРИДИЧЕСКИЕ НАУКИ

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The Moratorium on Capital Punishment (Мораторий на смертную казнь)

A human life is the greatest treasure given by God. According to the police statistics, only in January 2015 there were more than 175 000 crimes, and 9500 of them were serious. According to the latest survey on average24 kidnappings, 13 gangster attacks, 700 cases of intentional infliction of bodily harm that can result in the victim's death are committed every month. Currently, 1832 criminals sentenced to life imprisonment are held in the Russian penal institutions.

In 1997 Russia signed Protocol №6 for the Protection of Human Rights and Fundamental Freedoms, concerning the capital punishment in peacetime. From that moment the capital punishment "until its abolition" has not been imposed or used. For the most serious crimes the life imprisonment is imposed instead of the death penalty.

There are two opposite opinions in the society: for and against.In our society, some politicians, public figures and even ordinary citizens bring upthe issue of the abolition of the moratorium on capital punishment.

The results of polling have shown that 56% are in favor of the abolition of the moratorium, 33% are against, and 11% have not answered. Students'opinions are divided, and correspond to the general opinion of public consciousness in Russia.So we have come to the following conclusions:

1) capital punishment is a reliable tool in the strategy for the detention of criminals, and historically inevitable in the early stages of civilization;

2) under the existing conditions of modern civilization, the formation of the legal state and the civil society, the international community recognition of the human right to lifecapital punishment ceases to be the mean of restoring social justice, but it is rather the mean of retaliation and retribution;

3) capital punishment does not contribute to the correction of the convict, eliminating him as the object of correction influence;

4) the execution of capital punishment, unlike other types of criminal punishment is irreversible, so it eliminates the possible of the correction of judicial errors. The contradictory of public opinion is expressed in quite opposite views on the abolition of the death penalty;

5) in order to solve the problem of capital punishment(to use or not to use), it is necessary to any State to fight crime as it will help to improve the criminal legislation and will create favorable conditions for human life, thus contributing to the disclosure of personal potential.

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Legal problems of liability parties by state (municipal) contracts (Правовые проблемы ответственности сторон государственных (муниципальных) контрактов)

The process of signing contracts between the state and private contractors is governed by the Federal Law «About contract system in the procurement of goods, works and services for state and municipal needs». But some questions arise when this federal law sets grounds and terms when lawmakers establish responsibility for parties of contracts.

Firstly, these are customers' mistakes when they try to perform duties, when a lawmaker introduces the law of forfeit, not paying attention to details (part 7 state 34 Federal Law N_{2} -44), forgets to delete phrase «not less». In the future, it makes it impossible to recover this forfeit from the debtor.

Secondly, the corruption factor is also important. Determining the size of the forfeit, they push customers to use unfair fine in their own interests. This deficit can be used to «scare» honest suppliers by setting unreasonably high resolution of forfeit up to 5% per day of total amount of the contract or 50 % of the fine.

Thirdly, how much is to be charged: the sum of all contracts or only on the amount of unsettled obligations?

However, as soon as recovery of damages must restore the suffered interests, it would seem advisable to proceed from the amount of unsettled obligations. I think that this conclusion can also come through a theological interpretation of article 330 of the Civil Code.

In conclusion, to resolve these issues it is necessary:

1. To fix on legislative level the size of a legal forfeit to be raised from the supplier, and the ground of its recovery;

2. To install the same size of the forfeit for the customer and the supplier;

3. To establish the sum of forfeit that is to be charged only on the amount of unsettled liabilities of the party.

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Civil and military relations in independent Melanesian states (Военно-гражданские отношения в независимых Меланезийских государствах)

Among Melanesian countries, only Papua New Guinea and Fiji have armed forces. Like most states of Oceania, Papua New Guinea and Fiji are the members of the Commonwealth of Nations.

Fiji has overcome three military coups: in May and September 1987 and in May 2000. The 1987 coups were led by Sitiveni Rabuka, who justified his actions as necessary to ensure that political power was not lost to the Indian-dominated government. A race-based Constitution was introduced in 1990 to entrench Fijian political domination, but was changed in 1997 following international pressure. The 2000 coup followed a year after the election of Fiji's first Indo-Fijian prime minister, Mahendra Chaudhry. The coup was confronted by businessman George Speight and was backed by the army's elite counter-revolutionary warfare unit, which was linked to the nationalist Taukei movement. The military commander, Frank Batnimarama, opposed Speight and appointed a civilian prime minister pending new elections. The army was (and remains) deeply divided by the coup. The mutiny of November 2000 was viciously suppressed. Persecution of those involved in the 2000 coups and the mutiny continues.

Papua New Guinea didn't face the coup although several military rebellions and mutinies occurred. The most serious case was in 1997 in response to the government hiring of mercenaries to resolve the Bougainville conflict. The Papua New Guinea Defense Force mutinied and expelled the mercenaries, annoyed that the government managed to find funds for foreign army but not for its own ill-equipped forces. The prime minister was forced to step aside pending an inquiry and new elections.

There were several earlier examples of ruptures between the government and the military. In 1989, 400 soldiers marched on Parliament to demand pay increase. In 1988, the military defied the government's intention to close the Lae air base and occupied the airfield. In 1994, the maritime unit went on strike to protest against the lack of maintenance of naval vessels. There were frequent disagreements between the government and the military during the Bougainville conflict, with the military believing they had been denied essential resources. In 1996, members of the military were blamed on the assassination of the progovernment premier of Bougainville, Theodore Muriung. In March 2001, the army revolted on revealing extensive cutbacks in personnel. The reductions were reduced and the mutineers pardoned.

Although further military revolts are likely to arise, a full-scale coup is not anticipated due to the rifts within the military and poor discipline. There is also considerable tension between the police and the military. Should a coup occur, it is likely to be followed by a succession of countercoups.

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The problem of terrorism (Проблема терроризма)

There are a lot of problems in the modern world, such as global warming, environmental issues, natural resource shortages, earthquakes, floods and other disasters. But one of the most dangerous is terrorism. To achieve their goals, extremist groups kill hundreds of thousands of innocent people. One of such terrible groups is ISIS.

Since the start of the war in Syria in 2011, about 250,000 people have been killed and more than four million refugees have left their homes and most of them fled to Europe. That caused one of the worst ongoing migration crises. This human disaster has exposed Europe to the most significant terrorist threat for over 10 years.

Islamic State – is the extremist group that grew out of al-Qaeda in Iraq. It has inflicted severe punishments on those who transgress or refuse to accept its rule, including hundreds of public executions and amputations. Its fighters have also carried out mass killings of rival armed groups, members of the security forces and religious minorities, and beheaded hostages, including several Westerners.

In 2015, Syrian President Bashar al-Assad, sent the head of the Russian Federation Vladimir Putin a letter in which he asked for military assistance to Russia in fighting with the Islamic state terrorists. The Federation Council gave Russian President permission to use Russian troops outside the territory of the Russian Federation. Senators are voted unanimously, by 162 votes supporting this decision.

In late 2015, IS began attacks outside its territory. On October 31, 2015 a Russian passenger plane was shot down above Sinai province, killing all 228 on board. And then on November 13, at least 128 people were killed in a wave of attacks across Paris.

On March 14, 2015 Russian President Vladimir Putin made a decision about withdrawal of Russian troops from Syria. Taking into account the facts mentioned above, three purposes of the withdrawal of troops from Syria can be distinguished:

1. To improve relations with the West against background of the peaceful resolution of conflict in Syria;

2. Containment of Turkey and Saudi Arabia;

3. The pressure on the Assad administration.

Thus, the problem of terrorism is a major threat to many world powers. The only way to eliminate terrorism, at best, - is to come up with multilateral negotiations and agreements, at worst, - to use military equipment and weapons against them.

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Law and Domestic Violence (Закон и Насилие в Семье)

According to the Universal Declaration of Human Rights all human beings are born free and equal in dignity and rights.Domestic violence and abuse can happen to anyone, yet the problem is often overlooked, excused, or denied in terms of law. In most legal systems around the world the issue of domestic violence has been addressed only from the 1990s. Before the late-20th century, in most countries there was very little protection, in law or in practice, against domestic violence.

Domestic violence can take a number of forms, including physical, verbal, emotional, economic, religious, and sexual abuse, which can range from subtle, coercive forms to marital rape and to violent physical abuse. In abusive relationships, there may be avicious circle during which tensions rise and an act of violence is committed, followed by a period of reconciliation and calm. As a result of abuse, victims may experience psychological problems, such as post-traumatic stress disorder (PTSD), chronic health problems, mental illness, limited finances, poor ability to create healthy relationships with the increased risk of suicide, drug and alcohol abuse.Violence and neglect beget violence and neglect.

The way the individual rights of a family member versus the rights of the family as a unit are balanced vary significantly in different societies. This may influence the degree to which a government may be willing to investigate family incidents. In some cultures, individual members of the family are expected to sacrifice almost completely their own interests in favor of the interests of the family as a whole. Lack of adequate legislation which criminalizes domestic violencemay hinder the progress in regard to reducing the incidence of domestic violence.However, under international laws and standards, there is a clear State responsibility to uphold women's rights and ensure freedom from discrimination, which includes the responsibility to prevent, protect and provide redress - regardless of sex, and regardless of a person's status in the family. The response to domestic violence is typically a combined effort between law enforcement agencies, the courts, social service agencies and corrections/probation agencies. The role of each has evolved as domestic violence has been brought more into public view. Historically, law enforcement agencies, the courts and corrections agencies treated domestic violence as a personal matter. For example, police officers were often reluctant to intervene by making an arrest, and often chose instead to simply counsel the couple and/or ask one of the parties to leave the residence for a period of time. The courts were reluctant to impose any significant sanctions on those convicted of domestic violence, largely because it was viewed as a misdemeanor offense. This mindset of treating family violence as a personal problem of minor consequence permeated the system's response, and potentially allowed the perpetrator to continue acting violently. Activism, initiated by victim advocacy groups and feminist groups, has led to a better understanding of the scope and effect of domestic violence on victims and families, and has brought about changes in the criminal justice system's response.

The circle of violence set in motion in the home moves onto the streets and then back into homes, ruining the childhood of another generation and setting the stage for the perpetuation of all forms of violence and abuse. Violence against women is not a discrete phenomenon but one that underlines many aspects of our culture. It is time it was addressed as such. Abusive behavior is never acceptable, whether it's coming from a man, a woman, a teenager, or an older adult. You deserve to feel valued, respected, and safe.

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Cyberterrorism: phantom menace or idée fixe? (Кибертерроризм: скрытая угроза или идея фикс?)

Information is said to be the weapon of mass destruction nowadays. The 21st century is the era of computer technology. No specific laws exist to cover the Internet, and such crimes might include hacking, defamation over the Internet, copyright infringement, fraud and cyberterrorism.

Cyberterrorism is the act of Internet terrorism in terrorist activities, including acts of deliberate, large-scale disruption of computer networks, especially of personal computers attached to the Internet, by the means of tools such as computer viruses.

Cyberterrorism can be also defined as the intentional use of computer, networks, and public internet to cause destruction and harm for personal objectives. Objectives may be political or ideological since this can be seen as a form of terrorism.

There are some who say that cyberterrorism does not exist and is really a matter of hacking or information warfare. They disagree with labelling it terrorism because of the unlikelihood of the creation of fear, significant physical harm, or death in a population using electronic means, considering current attack and protective technologies.

However, there is an old saying that death or loss of property are the side products of terrorism, the main purpose of such incidents is to create terror in peoples mind. If any incident in the cyber world can create terror, it may be called a Cyber-terrorism.Dependence on the Internet is rapidly increasing on a worldwide scale, creating a platform for international cyber terror plots to be formulated and executed as a direct threat to national security.

Public interest in cyberterrorism began in the late 1980s, when the term was coined by Barry C. Collin. As 2000 approached, the fear and uncertainty about the millennium bug heightened, as did the potential for attacks by cyber terrorists. Although the millennium bug, the failure, in the programming of some software and chips prior to the beginning of the year 2000, to code year dates with all four digits, was by no means a terrorist attack or plot against the world or the United States, it did act as a catalyst in sparking the fears of a possibly largescale devastating cyber-attack. Commentators noted that many of the facts of such incidents seemed to change, often with exaggerated media reports.

The following three levels of cyberterror capability is defined by Monterey group:

• Simple-Unstructured: The capability to conduct basic hacks against individual systems using tools created by someone else. The organization possesses little target analysis, command and control, or learning capability.

• Advanced-Structured: The capability to conduct more sophisticated attacks against multiple systems or networks and possibly, to modify or create basic hacking tools. The organization possesses an elementary target analysis, command and control, and learning capability.

• Complex-Coordinated: The capability for a coordinated attack capable of causing mass-disruption against integrated, heterogeneous

defenses (including cryptography). Ability to create sophisticated hacking tools. Highly capable target analysis, command and control, and organization learning capability.

Cyberterrorism is, to be sure, an attractive option for modern terrorists, who value its anonymity, its potential to inflict massive damage, its psychological impact, and its media appeal. Because most critical infrastructure in modern societies is networked through computers, the potential threat from cyberterrorism is, to be sure, very alarming. Paradoxically, success in "the war on terror" is likely to make terrorists turn increasingly to unconventional weapons such as cyberterrorism. But although the fear of cyberterrorism may be manipulated and exaggerated, we can neither deny nor ignore it.As we build more and more technology into our civilization we must ensure that there is sufficient human oversight and intervention to protect those whom this technology serves.

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Practice as Source of Russian Criminal Law (Судебная практика как источник российского уголовного права)

The Russian legal science and practice tend to the negative opinion if the question whether the court has the right to recognize the source of judicial practice of criminal law is concerned.

Thus, M.N. Marchenko defines some of the most common thesis among the arguments that deny the role of jurisprudence as the source of the modern Russian criminal law.

Firstly, Marchenko says that the recognition of jurisprudence as the source of criminal law contradicts to the principle of the separation of powers, and this principle has no defined boundaries.

Secondly, according to M.N. Marchenko the recognition of judicial practice as the source of criminal law is not consistent with the characteristic features of the Romano-Germanic legal family, and this argument is irrefutable.

The third view is that the recognition of jurisprudence as the source of criminal law would be in conflict with the law-making activities of the Federal Assembly of the Russian Federation, however, the law-making is carried out on the basis of law and in strict compliance with it, filling some of the gaps in the legislation.

According to S. Alekseeva, jurisprudence has not found a specific place in the Russian legal system. Thus giving the courts the right to cancel the norms of governing bodies will fundamentally change the role of the court, and the courts can recognize them.

Taking into account the mentioned above, it can be admitted that the judicial practice exists in some way as the source of criminal law and it is important to the Russian legal system, but it is not included in the official list of the sources of Russian criminal law. So the question arises: how well will it fit to the actual needs of Russian society? Moreover, in future if judicial practice is created, will it contradict to the Russian law-making system and the court decisions or not? We think this is a very debatable issue if Russia is concerned, that the jurisprudence is not the official source of criminal law.

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Revisiting the restraints of freedom of non-defined contract (К вопросу об ограничениях свободы заключения непоименованного договора)

Current economic conditions in conjunction with burgeon commercial intercourse, scientific-technical progress; business competition determinates the capacity of making extralegal civil treaties, named as non-defined contracts.

Flow-through provision stems from article 1 of Civil Code of the Russian Federation, the basic principle of civil law – freedom of contracts. This principle makes itself felt in four incarnation disclosed in article 421 Civil Code of the Russian Federation: freedom to contract, freedom in choosing covenanters, freedom in choosing type/category of contract, freedom in finding contract conditions.

From our point of view, one of the debatable questions of the realization of freedom of contracts is the restrains of freedom of nonedefined contracts.

Firstly, non-defined contracts are regulated with prima facie the norms of general part of treaty-made law.

Secondly, we should keep in mind that the freedom of nondefined contracts is confined by the imperative norms of general part of civil law as well as generally recognized principles of civil law.

Thirdly, the qualitative norms of defined contracts are in capacity of limiter of freedom of non-defined contracts, because if agreement terms are identical to qualitative characteristics of defined contract, the treaty could not be non-defined.

To make a conclusion, we would like to point out that the freedom of contract could not be absolute. There are restraints of nondefined contracts, such as necessity of administration of the norms of general part of treaty-made law generally, non-admission of imperative rules breaking and generally recognized principles of civil law, as well as qualitative norms of defined contracts.

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The principles of law (Принципы права)

The principles of law are the guiding ideology, characterizing the content of the right, its essence and purpose in society.

Legal principles ensure unity of law and the legal regulation for the law in general, its branches and large legal institutions.

The principles of law play an important role in the legal regulation. First, they act as guiding ideas for the legislator, identifying ways to improve the rule of law. Second, the power bodies and officials are guided by the principles of law in making individual legal solutions. Thirdly, the principles of the right to help correct interpretation of legal norms.

The content of the current Constitution of the Russian Federation reveals the following principles of law: democracy, federalism, the priority of human rights and freedoms, the direct effect of the generally recognized principles and norms of international law, the rule of law, equality, equality of all forms of property, justice.

Let us consider some of the general legal principles in more detail.

The principle of justice is of particular significance. It is the most expresses the essence of general social rights, the desire to find a compromise between the parties to the legal relations between the individual and society, the citizen and the state. Justice requires consistency between actions and their social consequences.

The principle of priority of human rights reflects the fact that the natural, innate, inalienable human rights form the core of the legal system of the state. In accordance with Art. 2 of the Constitution of the Russian people, their rights and freedoms are the supreme value. The recognition, observance and protection of the rights and freedoms of man and citizen - the duty of the state. In Art. 18 of the Russian Constitution states: "The rights and freedoms of man and citizen shall have direct effect. They determine the meaning, content and application of laws, the activities of the legislative and executive authorities, local governments and guaranteed by law. "

The principle of equality enshrines equal legal status, i. e. equal constitutional rights and the same for all legal personality. Part 2 of Art. 19 of the Russian Constitution states: "The State guarantees equality of rights and freedoms of man and citizen, regardless of sex, race, nationality, language, origin, property and official status, place of residence, attitude to religion, convictions, membership of public associations or other circumstances . Any restrictions of the rights of citizens on social, racial, national, linguistic or religious affiliation. "

The principle of justice expresses guarantees for the protection of subjective rights in court. The h. 1 tbsp. recorded 46 of the Russian Constitution, "Everyone shall be guaranteed judicial protection of his rights and freedoms."

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Секция 3

НАУЧНО-ТЕОРЕТИЧЕСКИЕ И ПРИКЛАДНЫЕ ПРОБЛЕМЫ

(на материале кандидатских и магистерских диссертаций, выпускных квалификационных и научных работ студентов старших курсов)

АГРАРНЫЕ НАУКИ

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Impact of lead pollution on the activity of soil enzymes (Влияние загрязнения свинцом на активность энзимов почвы)

The soil as an important biogeochemical barrier and the basic sphere supporting life experiences extensive adverse effects. Among the scalable pollutants heavy metals occupy a special place. Concentrations of heavy metals led to a breach of natural terrestrial ecosystems in the soil.

Bioindicative research is becoming increasingly important in recent years because laboratory chemical analysis has limited capacity. Biological systems and the factors affecting them are monitored objects. Enzymes, performing a leading role in the processes of transformation of organic matter are sensitive indicators of the effects of different soilforming factors and changing conditions of functioning of natural biocenoses.

It is therefore of great interest to study the influence of heavy metals on soil enzymatic activity and the possibility of their use as bioindicators.

The paper presents experimental data on the effect of different concentrations of lead in concentrations of 5, 10, 20, 40 mg / kg of soil on the activity of redox enzymes urbonozema: catalase, peroxidase, polyphenol, oxidase.

The study demonstrates the different effects of lead on the activity of enzymes in the soil.

It has been found that lead exhibits a selective effect on the enzymes studied, i.e. at the same concentrations it inhibits the activity of some enzymes and stimulates the activity of the others. With increasing concentration of lead activity the catalase and polyphenol reduced, and peroxidase - increased.

Reduction of catalase and polyphenol oxidase activity may be associated with a reduction in the number of microflora under the toxic influence of lead on the microflora, which supplies enzymes into the soil, and also with blocking the active site of the enzyme lead ions.

Under the influence of lead the peroxidase activity increases, which is a testament to its highest sensitivity to the studied concentrations of toxicant.

Thus, changes in enzyme activity can indicate human impact on the soil.

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Sowing qualities of seeds of barley depending on application of growth promoting preparations (Посевные качества семян ячменя в зависимости от применения ростостимулирующих препаратов)

Introduction. Recently more and more attention is paid to barley as a raw material for the brewing industry. In the Republic of Bashkortostan there are 11 beer factories and 3 shops on production of beer which requirement annually makes about 40 thousand tons of grain of the barley meeting the requirements of brewing branch work now.

One of the most important conditions of providing in the republic of production of grain of barley in necessary quantity and the required quality is use on crops of high-quality seeds. The main signs of sowing qualities of seeds – energy of germination and laboratory viability.

Materials and technique of researches. Object of researches was culture summer barley brewing grades the Chelyabinsk 99 categories elite. Laying of laboratory researches was carried out in the spring of 2016 to laboratories of department of plant growing and agriculture of the Bashkir SAU. The scheme of experience included 3 options of processing of seeds of barley – control (H₂O), preparations Extrasol and Biodux. Seeds sprayed working solution (10 l/t) manually with the recommended doses of preparations: Extrasol - 1 l/t; Biodux - 3 ml/t. Indicators of energy of germination and viability of seeds defined according to the approved technique of determination of viability and energy of germination of seeds (GOST 12038-84).

Results of researches. By results of laboratory researches we have established barley responsiveness to growth promoting effect of preparations Extrasol and Biodux on preseeding processing of seeds.

Processing of barley seeds studied the experience of growth promoting preparations equally negatively has lowered the rate of energy of germination. For example, absolute value of energy of germination has made on options Extrasol – 33% and Biodux – 31% that in comparison with control is 17 lower also than 19%, respectively. Also have established that when calculating an indicator of viability of seeds of barley positive influence in option of Biodux – 92% is observed, in relation to control is 16% higher. In option Extrasol negative influence of action of a preparation has remained and the indicator of viability has made 64% that in relation to control is 12% lower.

Conclusions: By results of experience it is possible to conclude that barley Extrasol and Biodux has shown reaction to processing of seeds the studied preparations. Further studying of responsiveness of barley on these preparations at vegetation of plants is necessary.

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Factors of spring runoff of the rivers on the territory of the Bashkir Pre-Urals (Факторы формирования весеннего стока рек на территории Башкирского Предуралья)

Annotation. As the title implies the article describes the main factors of runoff formation during spring runoff. It is specially noted that the maximum runoff of the river in autumn is influenced by the moisture reserves, for the example of Urshak river. It is described in short that other factors have a significant effect on spring river flows. The text gives a valuable information about the long-term dynamics of maximum runoff Urshak river. It is spoken in detail that the main phases of spring runoff are in a long-term flow regime. The article is of particular interest to undergraduate and graduate students of hydrometeorological disciplines and will be of great help in writing diploma and course works.

The formation of maximum discharges of spring floods is the result of a complex interaction of many processes occurring in the river basin. All factors influencing the formation of spring runoff can be divided into two main groups: meteorological factors determining the intensity of snow melting, the formation of melting water and evaporation losses and the factors of underlying surface determining the amount of melting water accumulation on the surface of the basin and infiltration into the soil, the character of the snow distribution on the basin surface and the snow melting runoff on slopes and in rivers [1].

The estimated characteristics of spring floods include the maximum flow rate and the volume of runoff. As the rivers of Bashkortostan are fed mainly by melting water, the spring flood phase is especially shown here. In most parts of the investigated area the river runoff in the period of flooding is more than 50% of the annual runoff, and in some areas it reaches 60-80 % (the rivers of the western parts of the Urals).

On most of the rivers of the Bashkir Pre-Urals maximum discharges are generated only during floods. The maximum discharges of the same river significantly vary from year to year depending on meteorological conditions. The main factors are water equivalence to snow before the melting, the melting rate, the amount of precipitation during floods, humidity and the degree of freezing of soil, the presence of an ice crust on the soil surface [2].

The greatest discharges of floods are usually formed in a fine spring during intensive snow melting and low seepage losses (wet and frozen ground with the presence of an ice crust on the surface). As all factors influences the maximum discharges in the same direction, the phenomenon is unlikely to be because of the rarity of greatest discharges of floods (once in a hundred years or more).

The degree of saturation of the soil water before rainfall in the warmer part of the year directly determines the absorption of water by soil or the loss of surface flow. Similarly, early spring moisture affects the melting water runoff.



Fig.1. Combined schedule of maximum water discharge (m /s) and autumn moisture reserves in the soil (0-100 cm) before the establishment of the snow cover (mm) for Urshak river and meteorological station Chishmy, for the period 1961-2010 (compiled by the author to the data [3])

Examining the combined figure of water discharges and autumn soil moisture reserves (Fig.1), we can show a fairly clear interdependence of indicators. This trend can explain the large dependence of water loss for infiltration during the spring snow melting, the degree of saturation with moisture of the soil before the flood.

During spring runoff rivers receive their main power, which is actively used by a man for household activities during the limited season (summer-autumn). The synchronicity and the representativeness of spring runoff of the rivers suggest that the rivers reflect typical patterns of runoff for the forest-steppe zone of Bashkortostan Pre-Urals.

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Farming in the USA (Фермерство в США)

US farmers believe that agriculture is a big rural business. The most developed type of farming in America is a family farm, which has a long tradition. One of these traditions which are being passed on from generation to generation is a specialization on one particular type of agricultural products, on one culture. So, members of farming families make for themselves own working places.

About 69,000 large farms are registered in America today. 26,000 of them produce goods valued at \$ 1 million. Almost 50% of farms are small, family farms. The volume of their products is 1.5%. The size of the average American farm is about 180 hectares.

The report of the Ministry of Agriculture of America states that a net profit of an American farmer is 15 cents from a dollar. The remaining part is spent on wages of employed workers, transport costs, insurance, crops storage and other expenses. Due to farming, the Americans are spending on food much less than the citizens of european countries. Consumers spend \$547 billion for food originating on U.S. farms and ranches. Of each dollar spent on food, the farmer's share is approximately 23 cents. The rest are for costs beyond the farm gate: wages and materials for production, processing, marketing, transportation and distribution.

On average, every hour, 24 hours a day, 365 days a year, around \$6 million in U.S. agricultural products - grains, oilseeds, cotton, meats, vegetables, snack foods, etc., will be consigned for shipment for export to foreign markets.

Farmers work hard to gain the knowledge, training and skill to use chemicals safely and responsibly. Many farmers learned from their parents and have a lot of experience. But like other professionals, they also go to college, attend seminars and work with consultants. They are professionals in what they do.

In order to make a conclusion, I would like to say that farming is not as simple as we usually think about it. It is very hard and extremely competitive area of agricultural business which has a lot of nuances and know-hows. Farming as a structure of business is very complicated and thereby there are so many family farms with long tradition of heritage, knowledge and, of course, specialization. In my opinion, the role of farming is going to be high with the growth of population all over the world which will consequently ask a further generation very simple question: "How to provide the level of consuming that is not stable and always rises?"

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Die Wachstumskraft von Winterroggensamen der verschiedenen Größen (Сила роста семян озимой ржи разного размера)

Der Winterroggen ist eine wichtige Ernährungskultur, die stabile hohe Erträge in sehr ungünstigen Jahren hat. Eine der notwendigen Bedingungen hoher Erträge von Winterroggen ist die Nutzung vom hochwertigen Saatgut. Diese Samen haben unterscniedliehe Aufgehen, Keimungsenergie und Kraft des Wachstums. Das Ziel unserer Untersuchung ist die Bestimmung der Saatsqualität mit verschiedenen Größen der Samen. Als Material für die Untersuchungen waren die Samen von Winterroggen der Ernte von Sorten Chulpan 7 in 2015 aus Rayon Dürtüli. Die Probe der Samen werden in der Dicke durch die Laborsiebe mit länglichen Löchern geteilt. Das Gewicht von 1000 Samen wurde in GOST 10842-89 festgestellt. Die Wachstumskraft wird durch die morphophysiologische Methode von Bewertung der Sämlinge bestimmt. Unsere Unretsuchung zeigt, daß die Winterroggensamen der unterschiedlichen Größen verschiedene Wachstumskraft haben. Die Keimungslänge, die Wurzellänge und Wurzelanzahl unterscheiden sich in Versuchsarten. Das Gewicht von 1000 Samen mit verschiedener Samendicke verändert sich von 11,81 bis 35,8 g bei einer Quote von Variationen 19,4 %. Die Wachstumskraft stieg von 81,2 bis zu 94,8 % mit einer Zunahme der Samendicke, dabei die maximale Wachstumsenergie (94,8 %) bei Samen der Fraktion 2,4-2,6 mm war. Die kleine Samen (1,5-2,0 mm) hatte eine geringe Wachstumkraft (81,2-82,4%). Die Winterroggensamen mit unterschiedlicher Dicke haben nicht nur unterschiedliche Fähigkeit zu Keimen, sondern bilden die Sprossen mit der ungleichmäßigen Qualität. Die Samen der großen Fraktionen hatten die stärkeren Keimungen mit dem Gewicht 23,3-33,0 mg, im Gegensatz zu Sprossen aus kleinen Samen. Das lufttrockene Gewicht von Sprossen und Wurzeln aus Samen der unterschiedlichen Dicke sind unterschiedlich. Der Variationskoeffizient dieser Merkmale beträgt 4,82-24,96 %. Die Sprossen der großen Samenfraktion mit Dicke mehr als 2,0 mm hatten große Masse aus 100 Sämlinge (23,0-33,0 mg), als kleinere (15.7-19.7 mg). Man vermerkt verschiedene Erscheinungsformen des Anteils von Keimungsgewicht von Wurzeln in Abhängigkeit von der Dicke der Samen. Das Keimungsgewicht der großen Samen (83,6 %) in Bezug auf Keimungsgewicht der kleinen Samen (86,4 %) hatte eine geringere Äußerung. Nach dem Wurzelgewicht sank der Anteil der Wurzeln von kleinen Samen (13,6 %), und stieg Gewichtanteil von großen Samen (16,4 %). Größere Samen haben die großen Sprossen und große Wurzeln, sondern kleine Samen haben großen Sprossen und eine schwache Wurzelsystem in einem Gewichtsverhältnis. Die Wachstumskraft von Winterroggensamen in Abhängigkeit von der Dicke unterzieht sich also der Veränderung. Die Wachstumenergie der Samen steigt bis zu 94,8 % durch die Erhöhung ihrer Dicke. Stärkere Sprossen geben große Samen.

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Assessment of agroclimatic capacity of the regions of the Republic of Bashkortostan (Оценка агроклиматических возможностей регионов республики Башкортостан)

The Article on assessment of agroclimatic capacity of the districts of the Republic of Bashkortostan considers the questions which are important for agriculture of the Republic of Bashkortostan.

The main part is devoted to the analysis of agroclimatic conditions (temperature condition, rainfall, soil resources) two municipal districts of the Republic of Bashkortostan: Arkhangelskii and Davlekanovskii.

Authors, having analysed and having compared data on air temperature, including the sum of active temperatures and rainfall in Arkhangelskii and Davlekanovskii areas come to a conclusion that these areas have significant differences in agroclimatic conditions. In particular deficiency of rainfall is observed in Davlekanovskii district while in Arkhangelskii this indicator is normal and the difference of rainfall by years fluctuates from 10 to 50%. Comparing shares of arable lands, pastures and havmaking the following should be noted: the greatest percentage (59%) of the total area of agricultural grounds in Davlekanovskii district is arable lands, in Arkhangelskii the area for haymaking (46,5%). The smallest percentage is occupied: in Arkhangelskii by arable lands (26,3%), in Davlekanovskii-by haymaking (12%). The area of pastures in both areas slightly differs and occupies 29% of the total area of farmlands in Davlekanovskii district and 27,2% in Arkhangelskii.

In conclusion the main results of the work are as follows:

1. The Arkhangelsk area can be characterized as favorable for development of dairy and meat cattle breeding since the area has big areas of pastures and haymaking (73,7% of the total area of agricultural grounds) that allows to receive a significant amount of cheap forages.

The plant growing is less profitable since the area of arable lands and low exit of primary production is insignificant.

2. Development of plant growing in Davlekanovskii district will be the most profitable since it is promoted by a climatic zone of agriculture (the area has big areas of arable lands with high fertility), but agrotechnical actions have to be directed to moisture preservation as deficiency of rainfall is observed. A high exit of primary production with a considerable share of pastures allows developing of animal husbandry of mainly dairy direction.

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Studying agroecosystems on the example of Ltd "Sava-Agro-Yapryk" (Изучение состояния агроэкосистем на примере ООО «Сава-Агро-Япрык»)

Agriculture is one of the main sectors of economy. It provides people with meat, milk, grains and others products. Thus agriculture is the basis of world's food security that is the fundamental principle of sustainable development. Nowadays agriculture has a significant negative influence of anthropogenic activities: humus layer of soils is destroyed, excessive cattle grazing leads to desertification, the result of intensive melioration is water resources depletion. We can observe soil erosion process. So the studying of current state of this sector of economy and its problems is important.

In my work I study agroecosystems and ways of their optimization on the example of Ltd «Sava Agro Yapryk» that is located in Tuimazy district of the Republic of Bashkortostan. The main direction of its activities is cattle breeding. The bull's weight can reach 2 tones. Then Ltd "Sava Agro Yapryk" sells meat to meat processing plant "Sava" which produces sausages. The analysis of land resources allocation shows that the lands use as an arable (49 %), pasture (30 %) and 21 % of land are intended for hay mowing. The total area of farm is 2626 ha. Crops such as wheat, rye, barley, oats, maize and vegetables are grown at the Ltd «Sava Agro Yapryk».

The cattle represents cows, bulls and calves of different ages. The total amount is 1040. Also there are several dozens of horses at the Ltd «Sava Agro Yapryk».

The analysis of the ratio of land area and number of animals shows that the pasture burden on the natural grassland is exceeded. The estimation shows that it is needed to increase horses. Then the burden on the agroecosystem will reduce. Also it is needed to improve the structure of plants that are grown on the farm by the increase of legumes. It allows enriching the soils with nitrogen without the using of fertilizers.

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Die Bedeutung der Winterfestigkeit von dekorativen Kulturen (Определение зимостойкости декоративных культур)

Die Winterzeit ist ein schwerer Test für die Pflanzen immer, die aus den wärmeren Orten besonders zugestellt sind. Die Teilbeschädigungen des Pflanzenorganismus bringen zur Senkung ihrer Dekorativität und meistens zum Unterging. Nach den Arten und den Sorten der neuen dekorativen Kulturen, die jährlich auf den Pflanzenmarkt gebracht werden, ist der Abschätzengrad der Winterfestigkeit nicht bestimmt. In diesem Zusammenhang wird die für Bestimmung der Winterfestigkeit der dekorativen Bäume und der Sträucher, die auf dem Territorium der Republik Baschkortostan die ausführliche Erforschung introduciert und breit verwendet werden. Als Material für die Erforschung sind die dekorativen Bäume und die Sträucher aus der Pflanzenschule des Rayon Blagowetschnski «Blumengarten des Urals» gedient. Das Abschätzen der Winterfestigkeit der dekorativen Bäume und der Sträucher führten nach der Skala von Kostylewa D.A. durch, die nur 5 Grade der Winterfestigkeit hat:

1 - gibt es keine Beschädigungen (die Pflanze ist winterfest);

2 - überfrieren die Blumenknospen und\oder der Teil der einjährigen Sprosse (man kann nicht die Fruchtpflanzen verwenden, wenn nicht die Blumen, sondern die Kroneform und die Dekorativität der Blätter oder Blumen auf den Sprossen dieses Jahres Bedeutung haben);

3 - überfrieren die Pflanzen mit hoher Schneedecke (solche Pflanzen können in den Regionen mit der standfesten Schneedecke mit dem niedrigen Beschneide oder ihre ausgestreckte Forme, z.B. die Lianen, mit der Abnahme für den Winter verwendet werden);

4 - überfrieren die ganzen Pflanzen über der Boden (solche Sträucher können als Gehölzkultur verwendet werden, die auf den Sprossen dieses Jahres nachwachsen und blühen);

5 - überfrieren die Pflanzen völlig (Die Deckung muß werwendet werden).

Das Resultat der komplexen Bewertung der Winterfestigkeit von dekorativen Nadelbäume und den Sträucher hat die hohen Grade der Winterfestigkeit, von 1 bis zu 3 Graden. Die Grade der Winterfestigkeit von den Laubläume sind von 1 bis zu 5 Graden. Es zeigte sich, daß für Klima von Republik Baschkortostan die dekorativen Sträucher (*Buddleja davidii, Cotoneaster dammeri, Potentilla fruticosa*) nicht übergefroren sind.

Die ergebene Daten der Winterfestigkeit von dekorativen Holzpflanzen korrigieren die Liste der Sorten, die für Anpflanzung von Grünflächen empfohlen werden. Diese Daten weisen auch auf die Notwendigkeit der Einsetzung dieser Pflanzen unter örtlichen, dekorativen, winterfestigen Kulturen.

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Tillage practices for the intensification of soil destruction and humification (Приемы обработки почвы для интенсификации процессов деструкции и гумификации)

In Russia arable lands are depleted due to the lack of organic fertilizers. Chemical fertilizers are widely used and affect human health and result in soil degradation. Nowadays there is no proper tillage practice of straw blending in the Republic of Bashkortostan. Because of low temperature in spring and early summer stubbles are decomposed slowly which increases pathogenic flora in soil. Consequently tillage practices for the intensification of straw destruction and humification should be applied. Stubble embedding is of great importance as well. Currently available and suggested methods are listed in the table.

Available modes of straw embedding bring about mixing stubbles and soil which impacts microorganism colonies. Microorganism colonies in their turn affect the straw destruction and humification. Taking this in consideration new tillage method is suggested.



Figure 1. The developed tillage method for the intensification of soil destruction and humification (1- soil loosening; 2 – soil overturning; 3 – soil compaction)

The topsoil (150mm wide, 40mm thick) is undercut and ploughed up. Then it is laid down on the untreated soil surface and rolled down. The soil density must be within the limits of 1400-1600 kg/m3. The turned soil should be broken up and the soil density is supposed to be 1100-1200 kg/m3. It is important to uphold a certain depth and ensure optimal density of embedding which requires the development and application of adequate implements.

Thus, stripped stubbles laying and rolling provides faster bacterial growth thus enabling to turn straw into full-fledged organic fertilizer having high coefficient of humification.

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Seasonal dynamics and landscape phenology of Bashkortostan (Сезонная динамика и фенология ландшафтов Башкортостана)

The concept of "dynamics of a landscape" appeared in landscape science 40-50 years ago. Originally any changes of a landscape and its components were defined by it. V.B. Sochava defined dynamics of a landscape as "the diverse processes taking place (spontaneous and antropogenious) in modern geosystems (landscapes) and various transformations caused by them" [4, page 58].

Professor F.N. Milkov distinguishes the following types of dynamics of landscapes:

1) horologycal (spatial change of landscape borders);

2) structural (change of landscapes morphological structure);

3) temporary (changes in the landscape, connected with the time, duration, rhythm – dynamics of functioning, cyclic – daily and seasonal, fluctuating and periodic).

In this research we consider year (seasonal) dynamics which along with daily dynamics is subsection of cyclic dynamics of landscapes.

Seasonal changes of landscapes are defined by their water and thermal mode, and it, in turn, is defined by receipt of heat and moisture, and also internal properties of a landscape (ability to change and redistribute energy and substance streams arriving from the outside). Landscape-scientists and phenologists offered various schemes of a year cycle division. Division into seasons, subseasons, phases and stages was offered. So, professor V.A. Frisch distinguishes summer and winter seasons, and also spring and autumn inter-season periods of landscape structure, and four stages in each of them (formation, consolidation, culmination, degradation).

We will consider spring inter-season period on the territory of the Bashkir Pre-Urals, distinguishing the main stages. It is necessary to consider that the name of the last spring stage according to V.A. Frisch for stage is not absolutely correct. Therefore it is offered to use the phrase "the transitional presummer stage" instead of the word "degradation".

Stage 1 - formation of spring. On the territory of the Bashkir Pre-Urals the formation of spring inter-season period begins with the first thawed patches (the snowmelt beginning), it comes to an end with blossoming of a gray alder and a hazel grove. The radiation balance increases, its considerable part is spent on snow and ice thawing. There are thawed patches, but the soil usually continues to freeze through. Reservoirs are still held down by ice, but the runoff increases, at the end of the stage the flooding begins. The phenological indicator of spring approach is the first wave of the arrival birds e.g. rooks (March 5-15); the second wave - starlings, chaffinches, larks, fly in the first flies, mosquitoes, ants, spiders, butterflies small tortoiseshells appear (March 26 - April 5).

Stage 2 - consolidation. On the territory of the Bashkir Pre -Urals the stage begins with blossoming of an alder and comes to the end with an emergence of birch leaves. Vegetation of annual and long-term herbs begins, there are first leaves on some bushes, willow dusting begins, the number of blossoming species goes up, birch buds blossom out (May 3-6). From the beginning of blossoming of melliferous plants (willows) bees, bumblebees, wasps awake

Stage 3 - the culmination of spring. It begins with appearence of leaves in a birch and comes to an end with lilac and mountain ash blossoming. This stage - "the heat of spring" (May 10-20). There is a forward transition to a summer condition of a landscape and its components, the green aspect (without coniferous forest) is formed. On May 15-18 the last frosts occur in the air, and on May 20-22 - on soil surface are noted, at the same time average air temperature is over +10 °C. The amount of precipitation grows, but relative air humidity is practically

the lowest on the year, coefficient of moistening becomes minimum (0,6-0,65).

Stage 4- the transitional presummer. It begins with blossoming of a mountain ash and comes to an end with dogrose blossoming (May 20 - June 12). Since May 25-30 average daily air temperature is over +15 °C. Foliage formation comes to an end. At this time coniferous, deciduous trees and bushes blossom (a bird cherry on May 21-25, an oak on June 1-5, a mountain ash on June 5-8), low shrubs blossom (bilberry on May 20-23, cowberry on June 5-8). There is earing of cereals, blossoming of a meadow jug, an oxeye daisy. Nightingale trills stop with the appearance of chicks. Among insects there are dragonflies, gadflies. In the rivers the activity of fish begins. Blossoming of a dogrose finishes in spring inter-season period (on June 10 - 12).

As a result spring inter-season period or spring begins on the territory of the Bashkir Pre-Urals with the first thawed patches and an arrival of rooks (March 5) and comes to an end, harmoniously passing into a summer season, with dogrose blossoming (June 10-12). Period takes about 3 months.

Thus, season dynamics of landscapes is quite interesting and rather difficult. At the same time season dynamics allows us to observe the various processes taking place in landscapes of the Bashkir Pre -Urals. Moreover, the stages of certain spring inter-season period described above can be compared from year to year to distinguish unusual and abnormal phenological processes and phenomena, to define trends and changes.

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Mare's milk product development (Разработка продуктов питания на основе кобыльего молока)

Mare's milk is a unique product that has no biologically valuable analogues of mammary glands secretion of other farm animals species used in milking (cows, goats, camels, sheep, elk, and others.). Composition and biological properties of its main components are significantly different from other kinds of milk and are similar to human milk.

Mare's milk contains less protein and fat than cow's milk, but the biological activity of these components is much higher than that of cow's milk. Mare's milk protein is half represented by digestible soluble proteins of high biological value (albumin and globulin), fats mainly consist of essential unsaturated fatty acids. If cow' milk contains 85% of casein and 15% of albumin, in mare's milk this ratio is about 50,7% and 49,3%, so mare's milk is considered to have albumin characteristics. In addition, mare's milk is unique because of high content of Vitamin C and is rich in mineral composition. Energy density of 1 mare's milk kg is 990 kJ.

Consequently, mare's milk is a natural highly digestible product with high amino acid composition identical to that of human milk, is rich in polyunsaturated fats with bactericidal properties, is high in bifidogenic factor (5,8 - 6,4%) lactose) and is rich in multivitamin content. High biochemical activity and easy digestibility of mare's milk components are the basis for its widespread use not only as food, but also as disinfecting and prophylactic agent.

Clinical trials of dried mare's milk for feeding children who are allergic to cow's milk and deprived of breast milk at one year age, conducted by scientists of the Bashkir Medical University have shown that when reconstituted dried mare's milk is used for suckling instead of human breast milk, all the aspects of psychological and physical development of children meet the age parameters. Expanding the range of products based on the unique raw materials (mare's milk) has also an economic value, as consumer qualities of such products cannot be compared with their counterparts on the basis of cow's milk and their competitiveness on the world market is not of any doubt.

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БИОЛОГИЧЕСКИЕ НАУКИ

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Eschen-Ahorn aus Nordamerika (Клён ясенелистный из Северной Америки)

Der Eschen-Ahorn kommt aus Nordamerika, wo er ein typischer Vertreter in Auenwäldern und als Uferbegleitgrün ist. In Europa ist er mittlerweile heimisch. Der Baum wächst häufig auch als mehrstämmiger, weit ausladender Busch.

Der Eschen-Ahorn wächst schnell, wird aber mit maximal 20 m nicht sehr hoch. Die Blätter sind gefiedert, meisten mit drei Fiederblättchen, die wiederum häufig gelappt sind. Die Blätter werden ca. 20 cm lang und bis zu 15 cm breit. Das Blatt ist beim Eschen-Ahorn (bot. *Acer negundo*) grün, bei der Sorte *Acer negundo 'Aureo-Variegatum'* gelb gefleckt, dabei bei der Sorte *Acer negundo 'Flamingo'* hellrosa bis hellweiß und bei der Sorte *Acer negundo 'Variegatum'* weiß gerändelt oder gefleckt. Der Eschen-Ahorn bildet viele Früchte aus, die ab September von den Bäumen fallen. Die Flügelnüsschen sind immer paarig, das
heißt zwei Samen bilden eine Einheit. Die Flügel sind fast senkrecht angeordnet. Der Ahorn bevorzugt sonnige Gebiete mit ausreichender Wasserversorgung. Ansonsten ist er ein anspruchsloses Gartengehölz. Die Samen sind beliebte Nahrung bei Vögeln und Eichhörnchen.

Der silberbunte Eschenahorn bringt durch seine außergewöhnlichen Blätter schöne Kontraste in jeden Garten. In der Regel wächst diese Sorte zu einem mehrstämmigen, eher kleinen Baum oder zu einem mittelgrößeren Strauch von bis zu 800cm Höhe.

Er ist wärmeverträglich, frosthart und stadtklimaverträglich. Acer negundo gedeiht auf mäßig trockenen bis nassen, sauren bis schwach alkalischen und nährstoffreichen Substraten. Er ist oft in Parkanlagen, Gärten, Fußgängerzonen und zur Verzierung in Straßen und Alleen zu finden.

An der Universität haben wir eine Studie durchgeführt, wir haben die Keimung von Eschen-Ahorn in verschiedenen Naturräume zu vergleichen: in der Steppe (in der Nähe von Pleschanovo Orenburger Gebiet) und in der Waldsteppe (in der Nähe von Ufa Republik Baschkortostan). Keimung wurde in mindestens 10 Tage überwacht. Die Samen wurden gekeimt gerechnet, wenn sie den Keim und die Wurzel mindestens von 1 cm und keine Hinweise auf eine Virusinfektion hatten.

Unsere Beobachtungen: Samen Eschen-Ahorn (A. negundo L.), im Ohrenburger Gebiet ausgewählt (Steppenzone), haben einen großen Prozentsatz der Keimung (48% in 45 Tagen) im Vergleich mit den Samen der Republik Baschkortostan (37% in 45 Tagen), wahrscheinlich ist es möglich aufgrund des warmen Klimas in der Region Orenburg und kleiner Menge der natürlichen Konkurrenten. Diese Daten zeigen uns eine schwache Anpassung der Samen von Ahorn an die Bedingungen Waldsteppenzone Russlands und der städtischen Umwelt. Als Beweis kann die Saatgutforschung nachgewiesen werden, in der Nähe von Jekaterinburg ausgewählt und keine menschliche Einwirkung gehabt, hier zeigte 45 Tage Studie nur 12,2% der Labor Keimung.

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The problem of batteries disposal is one of the most urgent environmental issues (Утилизации аккумуляторных батарей – одна из наиболее актуальных экологических проблем)

Resource of any battery is limited to a period after which it becomes unfit for further use. In accordance with the classification of wastes the batteries are assigned to the 2nd class of danger. Exhausted batteries whose release into the environment is uncontrollable presents a serious danger for the environment. Only in Russia about 3 million batteries are produced annually and this about 90 thousand tons of lead, 22 tons of sulfuric acid and about ten thousand tons of other harmful components. Thus spent batteries are hazardous due to acid and lead poisoning of the environment.

Today various types of batteries are used. They have different applications, different parameters of size, appearance, recharge cycles, capacity, storage time and chemical composition.

The concentration of such chemical elements as lead, cadmium, nickel, potassium, lithium, zinc, cobalt, vanadium, manganese and their oxides and hydroxides can cause irreparable harm not only to ecology but also to human health. Therefore the disposal of batteries of automotive, aviation, industrial and other types is a serious problem whose solution allows to avoid the critical level of pollution of the planet.

There recently the network of collection points, which buy all types of batteries from individuals and organizations has started to expand. Processing enterprises which carry out reception of waste batteries must be licensed. In Russia there are still very few of them and they work only with large batches.

In recent times it has become much easier to get rid of battery devices which are used in portable equipment. Containers for collecting them are established in many shopping centers, specialized stores which sell housewares, hypermarkets. Disposal of waste batteries has attracted the attention of public organizations who are engaged in solving environmental problems. They organize mobile teams, hold events, set containers in the hallways. Separate collection of scrap which would partially solve the problem is organized only in major cities and have not brought about the desired effect.

Battery disposal conducted in accordance with the requirements of hazardous waste is aimed at protecting the environment and reusing valuable raw materials which are part of the product.

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Biocompatibility of synthetic and allogenic material (Биосовместимость синтетического и аллогенного материала)

It is known that tissue's reaction on implantation and the result of the operation depend on quality, chemical composition and structure of surgical suture material. Implanted suture material is an extraneous body, which remains in tissues of different organs for a long time. Long irritant action of the extraneous body often leads to chronic inflammation. On that basis, the goal of our research was to determine tissue's biocompatibility on implantation of synthetic suture material and allogenic tendinous strings. The research was conducted on fragments of bioptic tissues, which were withdrawn in the process of occasional remedial procedure from patients with previous cosmetic surgery using allogenic tendinous strings and synthetic vicryl suture material. Tissue biopsy was performed on material, taken from 24 patients in term of 10, 30 and 180 days after operation.

We counted the number of lymphocytes in the same field of vision at microscope X200 amplification. In application package Statistica v. 7.0 mathematical and statistical processing of the data obtained on the content of lymphocytes, which infiltrate the surrounding tissues around the implanted suture materials, was conducted. We counted descriptive statistics – the arithmetic mean of the average error (M), with the arithmetic mean error (s), standard deviation (Sd). By means of Mann-Whitney U-test a comparison of average number of lymphocytes in tissues, which surround suture material at different periods of time after operation, was performed. Morphometric research suggested that the number of lymphocytes in the zone of implantation of synthetic suture material is much higher than when implanting allogenic tendinous strings at all stages of observation (10, 30, 180 days).

The passage of the suture needle and thread through the tissue causes damage and death of the cell. These factors are the trigger mechanisms of inflammation that develops in presence of the extraneous body – thread. It is known that neutrophilic leukocytes appear first in the initial outbreak of inflammation, and then macrophages and fibroblasts appear. Macrophages resorb and phagocytize extraneous body. With the help of cytokines macrophages convert the reaction into fibroblastic phase, activating proliferation of fibroblasts synthesizing extracellular collagen. When applying non-absorbable suture materials (silk, capron, lavsan, in this case from vicryl) fibroblastic reaction is of evident nature, and a zone of major fibrosis (cicatrization) and chronic inflammation with the presence of increased quantity of disease resistant cells (such as lymphocytes, plasma cells, macrophages) is developed around the string. These are the processes we observed in our research.

Consequently the results of the research of tissues' reaction on implantation of synthetic suture material and allogenic tendinous strings provide an opportunity to draw a conclusion that allogenic biomaterial has higher biocompatibility, and tendinous strings have an absolute advantage over synthetic suture material.

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The role of interferon-induced gene transmembrane protein 5 (*IFITM5*) in the pathogenesis of osteogenesis imperfecta (Роль гена интерферон индуцированного трансмембранного белка 5 (*IFITM5*) в патогенезе незавершенного остеогенеза)

Osteogenesis imperfecta (OI) is a congenital metabolic bone disease, also known as "congenital deficiency and bone fragility" or Lobstein-Vrolik disease. OI is a hereditary connective tissue disorder characterized by bone fragility, blue sclera, short stature, hearing loss, bone fractures and dentine anomalies.

To date, 16 genes were identified, which are responsible for the development of 14 types of OI and the search of new genes that are involved in the pathogenesis of the disease is still continued. Mutations in patients with OI were identified in genes which encode proteins of type I collagen (*COL1A1, COL1A2*), cartilage-associated protein (CRAP) and bone conjugate IFITM-like protein BRIL (*IFITM5*), 38B transmembrane protein involved in the regulation of intracellular calcium levels (*TMEM38B*), etc.

Gene *IFITM5*, encoding a membrane protein, is located on chromosome 11 (p15.5). *IFITM5* (also known as BRIL) is a member of the interferon-induced transmembrane (IFITM) protein family having two transmembrane domains, which mediate a variety of cellular functions. Studies on mice showed that the protein coding *IFITM5* (BRIL) is specifically expressed in the skeleton, and it was suggested that it plays a positive role in osteoblasts mineralization.

In 2012 a single point mutation (c.-14C>T) in the 5' untranslated region of *IFITM5* has been identified in patients with osteogenesis imperfect type V. In 2014 a single point mutation (c.119C>T) in the coding region of *IFITM5* was identified in OI patients. All patients with mutations in *IFITM5* have been associated with OI type V. Although

IFITM5 is not directly involved in the formation of bone in vivo, the reason why *IFITM5* mutations cause OI remains a major mystery.

Thus, mutations in the gene *IFITM5* play an important role in the pathogenesis of OI and its identification is an important contribution to the development of diagnostic algorithms of DNA disease.

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Molecular-genetic study of Duchenne/Becker muscular dystrophy in the Republic of Bashkortostan (Молекулярно-генетическое изучение мышечной дистрофии Дюшенна/Беккера в Республике Башкортостан)

Duchenne muscular dystrophy and Becker muscular dystrophy are the most common hereditary diseases of the neuromuscular system. Duchenne muscular dystrophy (DMD) is an X-linked recessive disease that affects approximately 1 in 3500 male living births and results in muscle degeneration and death. DMD is one of the most severe and common forms of muscular dystrophy. Becker muscular dystrophy (BMD) is caused by mutations that lead to partial dystrophin deficiency resulting in a milder form of the disease with later onset and greater life expectancy. Most DMD patients show muscle weakness in early childhood, become wheelchair-dependent by 12 years old, and die of respiratory or cardiac failure in the late teens or early 20 s. DMD is caused by a mutation in the distrophin (*DMD* gene), that results in an absence of dystrophin protein expression, the largest known human gene, which is localized at chromosome Xq21.1, and covers \sim 2.4 Mb with 79 exons. DMD and BMD is accompanied by an increased level of muscle enzymes in the serum. Deletions/duplications are the most common type of disease-causing mutation of the *DMD* gene.

The purpose of the research is to study the molecular-genetic nature of DMD, the development methods of DNA-diagnostics of this disease in the Republic of Bashkortostan.

Using a multiplex polymerase chain reaction we studied the spectrum of deletions and the distribution of deletion breakpoints in gene dystrophin in 70 patients living in the Republic of Bashkortostan. We conducted the search of point mutations by the method of SSCP analysis and sequencing in the *DMD* gene. As a result of this study 3 new mutations were identified. In the 6th exon there was revealed a deletion of 4 nucleotides-c.401-404delCCAA, resulting in a shift of the reading frame (p.Thr134ThrfsX7). In the 46th exon there was revealed a deletion of adenine at position 6626- c.6626delA, resulting in a shift of the reading frame - p.Lys2210ArgfsX11. In the 6th exon a deletion of 3 nucleotides was identified- c.482-484del (Thr161del).

To date, there is no effective therapy available for DMD patients. Therefore, it is essential to make a prenatal diagnosis and provide genetic counseling to reduce the birth of such boys.

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The importance of investigating glaucoma on molecular level (Важность исследования глаукомы на молекулярном уровне)

Glaucoma is a leading cause of irreversible blindness. Glaucoma is a neurodegenerative disease characterized by the progressive loss of retinal ganglion cells. Glaucoma is divided into two major forms: primary open-angle glaucoma (POAG) and primary angle-closure glaucoma (PACG). Primary open-angle glaucoma (POAG) is the most common type of glaucoma in all populations. Most of the molecular mechanisms leading to POAG development are still unknown. Today, POAG is considered a multifactorial disease with threshold effect, which is associated with single or multiple genes mutation as well as external influences.

Although the pathogenesis of the disease is unknown, it is well established that the main risk factor for glaucoma is elevated intraocular pressure (IOP). Elevated IOP remains a major risk factor for the development and progression of open-angle glaucoma. The contribution of genetic factors in the development of primary open angle glaucoma, according to different authors, from 20 to 60%.

The gene MYOC is the most important among all known genes, which are involved in the outflow of function aquesous humor from the anterior chamber of the eye. Myocilin (*MYOC*) was the first gene identified for POAG. Myocilin was also known as trabecular meshwork inducible-glucocorticoid response protein (TIGR.) *MYOC*-associated glaucoma is transmitted as an autosomal dominant Mendelian trait. From 3% to 5% cases of POAG are caused by mutations in the gene myocilin. Most of the mutations that have been identified in patients with POAG are localized in the olfactomedin domain. Among more than 70 reported mutations the most common mutation is Q368X. Unfortunately, pathophysiology mutant protein influence is unknown still, but there are the assumption that a sintes is mutant myoclin leading to a violofion of the outflow of intraocular fluid through the trabecular meshwork, which leads to an increase in intraocular pressure.

Pathogenesis of the primary open angle glaucoma as a multifactorial neurodegenerative disease has not been fully studied, and the modern means of treatment is not always effective in preventing the development of glaucomatous optic neuropathy. At present, substuntial progress has been reached in developing the neuroprotective therapy of a glaucoma for restoration of the vital visual functions. The glaucoma blindness prevention is early diagnosis, timely treatment and assessing the degree of disease progression.

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Der Kornealsequester der Katzen (Корнеальный секвестр у кошек)

Während meines Praktikums als Tierarzt habe ich vor allem Augenkrankheiten der Tiere erforscht und studiert. Das Thema meiner Diplomarbeit ist der Kornealsequester der Katzen. Das ist die Krankheit der Augenhornhaut der Katzen. Diese Krankheit befällt oft solche Katzenrassen wie die Schottische, Britische, Persische Katzen und Sphinx-Rasse.

Der Erreger der Krankheit ist eine Herpesvireninfektion. Die Hornhaut hat dann ein Nekrosenteil.

Das Zeil der Arbeit ist die Förderung der Verheilung des Auges durch Verwendung vom Serum des Tierblutes.

Während des Praktikums haben wir 12 Katzen mit dieser Krankheit gehabt. 6 Tiere wurden operiert. Sie haben antibakterielle Augentropfen bekommen. Die anderen 6 Katzen wurden auch operiert, aber sie haben antibakterielle Augentropfen und Blutserum bekommen.

Nach 10 Tagen hatten die Katzen der ersten Gruppe eine Schramme von weißer Farbe auf der Hornhaut. Am 30. Tag verschwand die Schramme.

Nach 10 Tagen war die Schramme der Hornhaut der Katzen der zweiten Gruppe nur schwach zu sehen. Nach 20 Tagen verschwand sie überhaupt. Die Verheilung der Augen ist also schneller verlaufen.

Die Resultate der Arbeit sind folgende: Die Verwendung des Blutserums fördert die Verheilung der Hornhaut und der Regeneration der Sehkraft der Katzen. Es ist also empfehlenswert, das Blutserum beim Kornealsequester der Katzen zu benutzen.

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Phytochemical characteristics of Campanula Persicifolia (Фитохимическая характеристика колокльчика персиколистного Campanula Persicifolia)

The diet of Russians is characterized by an excessive intake of fats and digestible carbohydrates, but at the same time, it is deficient in point of dietary fibers having sorption and detoxification properties. Deficiency of soluble dietary fibers (pectin, gums, agar-agar, alginates) is proposed to fill by polysaccharides of the root fruit of Platycodon grandiflorus and Adenophora lilifolia. Other types of bluebells are poorly understood. Of particular interest is Campanula persicifolia, the above-ground part of which has previously been used as salad greens. Phytochemical evaluation of this kind was held by M.A. Abdulmanova with co-workers in 1961. Since then, the analytical framework has been changed significantly, allowing us to examine the chemical composition of this plant more thoroughly.

The aim of the present study was phytochemical study of Campanula persicifolia. The following tasks were set: 1) to study the content of flavonoids and oxycinnamic acids in different organs of C. persicifolia; 2) to study the content of polysaccharides in the raw C. Persicifolia materials and the structure of polysaccharides by the method of infrared spectroscopy.

In the study the following methods were used: spectrophotometric determination of flavonoids in the form of AlCl3complex, thin layer chromatography of ethanolic extracts. The ratio of selected flavonoids and oxycinnamic acids was performed using densitometer Sorbfil, the content of polysaccharides was determined by the gravimetric method after precipitation by ethanol.

For the analysis the raw materials of C. persicifolia collected in the Tuimazinsky district of Bashkortostan was used. Before drying the raw materials were separated into three fractions: stems, leaves and inflorescences. It was established, that the greatest content of flavonoids in the extracts of C. persicifolia based on luteolin, was discovered in the flowers, then in leaves and in stems. In inflorescences the flavonoid content was $1.4\pm0,09\%$; in the leaves $-1.3\pm0.10\%$, and in the stems $-0,30\pm0,08\%$. In the flowers and leaves of C. persicifolia five compounds of phenolic nature were discovered, one of them was presented by coffee acid. Fewer compounds of phenolic nature are found in the stems of C. persicifolia. The stems of C. persicifolia contain 7.2% of polysaccharides, inflorescence $-6,5\pm0,15$, leaves $-5,3\pm0,10\%$. The data obtained indicate the feasibility of introducing the studied species of C. persicifolia in the diet.

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Description of DROSHA gene (Описание гена DROSHA)

Members of the ribonuclease III superfamily of double-stranded (ds) RNA-specific endoribonucleases participate in diverse RNA maturation and decay pathways in eukaryotic and prokaryotic cells.

DROSHA (Drosha, Ribonuclease Type III) is a Protein Coding gene. Diseases associated with DROSHA include combat disorder and ovarian serous carcinoma. Among its related pathways are Proteoglycans in cancer and Translational Control. GO annotations related to this gene include poly(A) RNA binding and RNA binding.

Protein attributes for DROSHA Gene composed 1374 amino acids, molecular mass: 159316 Da.



Fig.1: Position of a gene on a chromosome (http://www.genecards.org)

Drosha and other miRNA processing enzymes may be important in cancer prognosis. Both Drosha and Dicer can function as master regulators of miRNA processing and have been observed to be downregulated in some types of breast cancer. However, the nature of the association between microRNA processing and tumorigenesis is unclear.

Human Drosha was cloned in 2000, when it was identified as a nuclear dsRNA ribonuclease involved in the processing of ribosomal RNA precursors. The other two human enzymes that participate in the processing and activity of miRNA are the Dicer and Argonaute proteins.

Both Drosha and Pasha are localized to the cell nucleus, where processing of pri-miRNA to pre-miRNA occurs. This latter molecule is then further processed by the RNase Dicer into mature miRNAs in the cell cytoplasm. Both Drosha and Dicer also participate in the DNA damage response.

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The component composition of the wormwood Artemisia absintium in the republic of Bashkortostan (Компонентный состав полыни горькой, произрастающей в республике Башкортостан)

The search for new species of medicinal raw materials is perspective for the development of modern medicine. The most interesting in this regard is a genus *Artemisia*, in particular, the wormwood (*Artemisia absinthium*). It is a perennial herb with a strong aromatic odor and bitterness. Plants of the genus *Artemisia* are common in Russia, they are widely used in medical practice [1].

It is known that the pharmacological properties of the genus Artemisia plant are associated with the content in it the essential oil and sesquiterpene lactones [2-4]. The phenolic compounds such as flavonoids are also possessing a wide spectrum of biological activity.

By repeated extraction with chloroform from the wormwood, gathered near Lekarevka village in Ufa region of Bashkortostan, the hood was obtained. The composition of the main components was determined by the gas chromatography-mass spectrometry method.

Dry wormwood in the amount of 14.5 g was treated several times with chloroform at 62 °C. The resulting chloroform extract was filtered. The analysis of component composition was also done by gas chromatography-mass spectrometry.

The mass spectrometric analysis was carried out on a GCMS-QP2010S Shimadzu spectrometer (EI, 70 eV) with the detected masses range of 33–500 Da using a HP-1MS capillary column (30 m×0.25 mm×0.25 μ m), the evaporator temperature 280°C and the ionization chamber temperature 200°C. The analysis was carried out in the temperature programming mode from 50 to 280°C with the heating rate of 10°C min⁻¹, the carrier gas helium (1.1 ml min⁻¹).

As a result, 44 peaks were revealed and about 15 of them were identified. There were found monoterpenoids β -myrcene (2.7 %), thujone (3.5 %), diterpene phytol (1.5 %), several sesquiterpenes: neril-(S)-2-methylbutanoate (0.7 %), globulol (0.6 %), linalyl-3-methylbutanoate (0.4 %), acyclic compounds (15,8 %) also were detected.

These data suggest the presence of biologically active substances in wormwood, which could be isolated further and modified. Improving the well-known and the new methods of biotransformation of terpenoids with purpose of getting enantiomerically pure compounds is essential for perfumery, food and medical industries. This question still keeps in attention of specialists in the field of chemistry, microbiology, biochemistry and genetics.

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The dynamics of the number of mammals in Zilairsky region (Динамика численности животных в Зилаирском районе)

Zilairsky region in the Republic of Bashkortostan is rich in forests, but special works generalizing hunted animals in the area were not carried out. Many mammals which are important objects of sport and fur hunting, are hilled in a significant amount for their meat and skins.

Due to many years of intensive hunting and mainly to the conditions of habitats and food base, the number of mammals ranges. In this connection, the study of the biology and population dynamics is a highly urgent and timly task.

Natural climatic conditions of Zilairsky region especially its mountain - forest area, are favorable for hunted animals. The environmental conditions of the region are optimal for inhabiting, reproduction and distribution of animals. The fauna is characterized by great diversity and number of species. There are numerous species of animals such as elk, boar, badger, marten, bear, lunx. Along with typical forest types there are the representatives of steppe landscapes: brown hare, common marmot-bobac, a large ground squirrel, partridge, quail. Commercial species - fur-bearing animals, birds, fishes, which are the objects of organized economic activites of people are of great interest.

In recent years the lands of Zilairsky region have undergone enormous changes: building dams, livestock grazing in early summer periods, which has adverse effect on the environment and intoxicating effect on many species of game animals. The number of major animals species remains at a stable level. Special attention was paid to the number account and their placement on the territory of the area. An important part is given to significant biotechnical activites, territory protection etc. The developed a plan of biotechnical and hunting measures, creates better conditions for the main habitat of fauna, preservation of favorable conditions for animals and plants listed in the Red Book.© Мустахитдинова Регина, 2016

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The content of biologically active substances in the roots of Arctium lappa (Содержание биологически активных веществ в корнях Arctium lappa)

In recent years, a marked worsening of the demographic situation in our countryis noted. The frequency of the number of multifactorial diseases (hypertension, diabetes, etc.) is increasing. The number of cancersand congenital malformations is also increasing. The main reasons for this situation are the critical deterioration of the environment due to chemical pollution, and changes in the diet of Russians.

To organize the production of drugs based on the burdock it is necessary to study the factors that affect its quality. In this regard, the goal to compare the content of biologically active substances in the raw roots of burdock, assembled in two regions of the Russian Federation (Stavropol Krai and the Republic of Bashkortostan) was set. The comparison of the content of phenolic compounds (phenol carbonic acids and lignans) was conducted in alcoholic extracts of roots of *A. lappa*, lipophilic components in the hexane extracts, polysaccharides in aqueous extracts.

Fresh roots of burdock were regarded as the subject of research. The extraction and lipophilic phenolic compounds from raw *A. lappa* was carried out in a Soxhlet apparatus. Component composition of *A.* *lappa* hexane extracts samples was identified by gas – liquid chromatography – mass – spektrometry. The content of polysaccharides was determined by gravimetric method.

The comparison of the lipophilic fraction of burdock root showed the differences in the content of compounds having antioxidant activity. In the Ural samples the content of linoleic acid is 3 times lower than in Caucasian samples. In the samples *A. lappa* campesterolis contained much more in the roots of Bashkir origin than of Stavropol origin. On the content of phenol carbonic acid the differences in compared samples were not found. The differences in content of polysaccharides are unreliable.

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Gebrauchte Eisenbahnschwellen und ihre Wiederverwertung (Использованные железнодорожные шпалы и их переработка)

Für die Herstellung von Bahnschwellen sind verschiedene Bäume: Kiefer, Lärche, Buche, Eiche verwendet worden. Eisenbahnschwellen müssen vielen Anforderungen gerecht werden. Sie müssen neben den Fahreigenschaften besonders der Witterung widerstehen können. Es gibt Bahnschwellen aus Stahl, Spannbeton oder Kunststoff. Hölzerne Bahnschwellen müssen mit Holzschutzmitteln gegen die Witterung und den Befall von Holzschädlingen behandelt werden. Holzbahnschwellen werden in der Regel recycelt und einer energetischen Verwertung in sogenannten Biomassekraftwerken zugeführt. Diese Kraftwerke erzeugen Strom aus diesem recycelten Holzabfall.

Viele Länder haben Probleme mit der Wiederverwertung von veralteten Eisenbahnschwellen aus Holz, weil sie organische Verbindungen mit den toxischen und kanzerogenen Eigenschaften enthalten. Sie sind aufgrund des Gesundheitsrisikos des behandelten Holzes als gefährlicher Abfall zu entsorgen. Die Imprägniermittel und die Rückstände aus dem Bahnbetrieb stellen Gefahr für Gesundheit und Umwelt dar. Aufgrund des Altöls aus Radlagern, geschmierten Teilen von Schienenfahrzeugen, des locker gebundenen Staubs aus teilweise asbesthaltigen Bremsbelägen sowie Ruß aus Abgasen machen Bahnschwellenabfall gefährlich und sie müssen als Sonderabfall entsorgt werden. Bei häufigem Hautkontakt oder bei Kontakt mit Lebensmitteln könnte dies gefährlich sein. Die gesetzlich nicht sanktionierte Unterbringung der Eisenbahnschwellen ist ökologisch schädlich und teuer. Inzwischen hat die Wiederverwertung einen Vorrang zu der Bewahrung und Vernichtung, weil sie alternative Energiequelle und Rohstoff sein können.

Hauptproblem der Wiederverwertung der Schwellen ist das Recycling ihrer Imprägnierung. Schon verbrauchte Eisenbahnschwellen werden in zwei Stufen wiederverwertet: 1) Recycling der Kreosot Verbindungen mit Hilfe des Präparates "Lenoil"; 2) direkte Verarbeitung von Holz. Das Biopräparat "Lenoil SHP" hat eine oxydative Aktivität hinsichtlich Kohlenwasserstoffe der Paraffine, Naphten- Kohlenwasserstoffe, Aroma Wasserstoffe, Erdölfraktionen und einiger oxidierten Kohlenwasserstoffe, die Industrieökotoxikante sind, sowie trägt es zur Zerlegung von Fetten verschiedener Herkunft bei. Oxidierende Aktivität wurde mittels Endprodukts, d.h. Absonderung von CO, bestimmt.

Laut der Analyse enthält die nicht wiederverwertete Eisenbahnschwelle Späne Phenol, Ether, Kreosot, Naphthalin, Anthrazen und andere Verbindungen, die schädliche Einwirkungen haben. Nach der Bearbeitung von Präparat sinkt das Prozentgehalt der Schadstoffe. Die Wiederverwertung von Holzindustrieabfällen durch die Biomethoden ist sehr erfolgreich, effektiv und ökologisch günstig.

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The Algae (Водоросли)

I am very interested in algae, because they play a very important ecological role. They are the beginning of the food chain for other animals. Phytoplankton are eaten by small animals called zooplankton that drift near the surface of the sea. The zooplankton are in turn consumed by larger zooplankton, small fish. Larger fish eat the smaller one.

The theme of my research is the study of algae in three districts. They are: Iglinskiy, Gafuriysky and Askinsky.

The study consists of three phases:

-collecting the material in the nature;

-theprocessing of soil samples;

-analyzing the data.

The selection of algae samples was conducted in the summer season of the years 2013-2014.

I studied the different types of algae, which refers to such lasses as green, diatoms and red etc.

Chlorophyta is a division of green algae, informally called chlorophytes. The species of Chlorophyta are common inhabitants of marine, freshwater and terrestrial environments.

Diatoms are a major group of algae, and are among the most common types of phytoplankton.

Diatoms belong to a large group called the heterokonts, including both autotrophs and heterotrophs.

The red algae are one of the oldest groups of eukaryotic algae. The Rhodophyta form a distinct group characterized by having eukaryotic cells without flagella and centrioles.

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Morphogenetic responses of wheat plants the effects of herbicides (On the ''Omsk 36'' Example varieties)

Hormesis is stimulation of any system of the body by external influences not enough powerful for manifestation of harmful factors (the concept was introduced by Southam C.M. and Ehrlich J.in 1943).

The term hormesis has synonyms such as adaptive stress. These definitions apply to many biological systems, and stressful factors. For example, there is a radiation hormesis, herbicide hormesis and others.

There is a hypothesis that the treatment of plants with low doses of herbicides, causes hormetic effect which is an increase of the crop yield. In domestic science the impact of herbicides on the crops being studied is extremely rare. Abroad, this theme is the subject of many works and studies.

The morphogenetic reactions of wheat showed that high doses of herbicides caused morphological enhancement of plant integration, which can be regarded as a manifestation of a defensive reaction.

5 herbicides were tested: dicamba, clopyralid, chlorsulfuron, glyphosate, 2,4-D. Morphological integrity of the two-week plant was calculated as the average ratio for the pair of determination of all characteristics (r_{2m}). The obtained results showed a nonlinear response to increasing doses of plant herbicides.

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The impact of biological product Fitosporin on the microbiota of sugar beet in the conditions of soil contamination by phytopathogen

(Воздействие биопрепрата Фитоспорин на микробиоту сахарной свеклы в условиях заражения почвы фитопатогеном)

Currently, for protecting plants against phytopathogenic bacteria mainly chemical pesticides are used. But there are alternative ways of protection, such as environmentally friendly biologies. It is known that one of the most promising agents of biological control of plant diseases are bacteria - endophytes genus *Bacillus* Cohn, which have antagonistic properties against pathogens and can significantly affect crop yields.

The aim of this study was to investigate the influence of the biologies Fitosporin on microbial activity in the rhizosphere of sugar beet in the conditions of the soil contamination phytopathogen.

Biological product, based on *Bacillus subtilis* D 26, has fungicidal properties [1]. Field experiments were carried out on small plots of 5 m2. Shoots were infected with phytopathogen by treating with suspension containing mycelium and conidia mikromitcety *Alternaria alternate*. In the phase of 2-3 and 4-6 pairs of leaves the plants were treated with biological preparation Fitosporin. Sample selection for analysis was performed three times. The ground from under the plants infected by phytopathogen but untreated with biopreparation served as a control. The number of microorganisms was recorded in laboratory conditions by plating on solid nutrient medium [2].

Using Fitosporin for the treatment of infected sugar beet plants contributed to the increase of cellulolytic microorganisms, which participate in the decomposition of plant residues. Their number at the end of the growing season plants increased 2 times compared with the control. Biologic treatment provided a reduction in the number of soil pathogenic fungi. The number of this group of microorganisms was reduced on average by 22% compared to controls.

Thus, the study showed that the biological product Fitosporin inhibits the growth of pathogenic fungi that cause diseases of crop plants. The use of this biological product also leads to an increase in the number of cellulolytic microorganisms.

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Molecular genetic studies of primary open-angle glaucoma (Молекулярно-генетическое исследование первичной открытоугольной глаукомы)

Glaucoma is a global medical and social problem, as it is the leading cause of irreversible blindness and low vision. Genetic and clinical differences in the occurrence of the disease determine the need for further study of molecular-genetic nature of the disease.

The cytochrome P450 (*CYP1B1*) gene is located on the short arm of chromosome 2 in locus 2p22.2. *CYP1B1* gene expression protein of the gene is a multifunctional enzyme involved in the metabolism of fatty acids, retinoic acid and 17-beta estradiol, steroids and melatonin. In a study of single nucleotide polymorphisms in *CYP1B1* gene in French primary open-angle glaucoma (POAG) patients the polymorphism Asn453Ser association with clinical features of glaucoma, such as change in the optical disc and narrowing of the visual field was determined [3].

Other researchers have found two polymorphic variants in gene *CYP1B1* (rs162562 and rs10916) associated with each other, which are present at severe forms of the disease POAG [2]. For example, the c.1666G allele of the Leu432Val in *CYP1B1* showed a statistically significant higher representation among POAG patients compared to controls suggesting it to be a potential risk allele toward disease predisposition. *CYP1B1* Val432 was estimated to generate higher reactive oxygen species (ROS) in retinal pigment epithelium (RPE) cells compared to its allelic variant. Higher ROS generation by Val432 in *CYP1B1* might lead to apoptotic change that leads to glaucoma. Comparison of haplotype diversities revealed CGGTA as the risk haplotype for the disease (p=0.0001) [1].

Thus, the study of polymorphisms and mutations in the *CYP1B1* gene will allow a better understanding of the mechanism of inheritance of POAG and holding its pre-diagnosis and prevention it with patients before the onset of clinical signs.

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Study of distribution of titanium dioxide nanoparticles in brain structures of rats after nasal administration (Исследование распределения наночастиц диоксида титана в структурах головного мозга крыс после их интраназального введения)

Nanoparticles (NPs) of titanium dioxide (TiO2) are produced on a large scale and are widely used in various industries and medicine. In medicine (NPs) of TiO2s are used as drug carriers and (NPs) TiO2 nanotubes are used as glucose sensors and nanosensors, O2, H2O2, humidity, etc. However, some researchers note the lack of proof of their safety use in medicine. The main ways of TiO2 NPs entering the human and animals are inhaled, oral and percutaneous ways. The main target organs are the tissues of the respiratory, intestinal, immune, skin systems, and critical of the consequences of their actions are the brain, bone marrow, reproductive and excretory organs.

The purpose of this study is to investigate the effect of TiO2 NPs intranasal administration on the structural characteristics of neurons using electron microscopy. The study was performed on nonlinear female white rats weighing 200-250 g (n = 6). All animals were kept in

the same vivarium conditions at the standard balanced ration. A nasal insufflation NPs 40-60 nm sized TiO2 in a concentration of 50 mg / kg was carried out for 30 days. For carrying out microscopic studies the brains of the animals were fixed by immersion in chilled 2.5% glutaraldehyde phosphate buffer solution (pH 7,4), and postfixed in 2% OsO4 solution, dehydrated in ethanol and embedded in Epon-812. Ultrathin sections were prepared and analyzed in a transmission electron microscope JEM 200EX (75 kV). To determine the translocation of the NPs TiO2 the brains were examined for 14 and 30 days of the experiment.

The results of the study showed that after 14 days of NPs exposure TiO2s were detected in the olfactory bulb, the hippocampus and amygdala. The highest accumulation of NPs in the hippocampus was for 30 days. In this structure a large expression of neurodegenerative changes was observed. It was confirmed that the NPs ofTiO2 inhalation migrate from the olfactory bulb to the various structures of the brain and affect them. It is shown that the function of neurons in the hippocampus thus suffer more.

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Flora of higher plants, growing on the beach of the Usolka river (Флора высших растений, произрастающих на берегу реки Усолка)

Usolka is the river in Russia, flowing in the Republic of Bashkortostan, the right tributary of the Belaya River. The Usolka is considered to be the largest body of water in the "Krasnousolsk" resort area. It rises on the western slope of the ridge Takata, 1.5 km to the north of Mount Ayuly. It flows from the southeast to the northwest of the Gafuriysky region and flows into the Belaya river, 669 km from its estuary. Its length is 55 km, the basin area is 380 square kilometers. Mineral springs have significant impact on the chemical composition of water [1]. The flora of higher plants growing on the bank of the Usolka has not been previously studied. Identification of the flora is of great importance for the organization of monitoring on water bodies [2]. To conduct the study in June 2014 a journey to the Usolka was organized and herbarium was assembled. 17 species of flowering plants were revealed: Equisetum arvense L, Potentilla anserina L., Trifolium hybridum L., Alopecurus pratensis L., Seseli coloratum L., Artemisia absinthium L., Lysimachia vulgaris L., Artemisia vulgaris L., Cynoglossum officinale L., Agrimonia pilosa L., Galium album L., Ranunculus polyanthemus L., Onopordum acanthium L.

Then we carried out the simplest variant of flora analysis, in which the presentation of different families is set. We identified the representatives of 12 families: Composite family (Asteraceae), Legumes (Fabaceae), Cereals (Poaceae), Rose family (Rosaceae), Carrot family (Umbellíferae), Primulaceae family (Primulaceae), Ranunculaceous family (Ranunculaceae), Bindweed family (Convolvulaceae), Rubiaceae family (Rubiaceae), Scouring rushes (Equisetaceae), Borage family (Boraginaceae), Nettle family (Urticaceae).

Representation of different families reflects the character of the flora. In this example the natural flora of the community (meadows) is considered. Composite family is widely represented (23.5%), Cereals, Rose family and Carrot family are represented by 2 species. According to the classification of Papchenkova [2], these plants belong to the group of 11-gigromezofitam (silverweed cinquefoil, foalfoot, etc.). They occupy high levels of the coastal flood zone and the splash zone of the water bodies. They are rare in the aqueous medium. They can also be classified as hygrophytes – wet land plants of wetlands and periodically flooded habitats with high humidity.

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The microphytobenthos of the Usolka river (Микрофитобентос реки Усолка)

The therapeutic mud of the Usolka river, used as a valuable therapeutic factor in the resort "Krasnousolsk"[1], was studied in September 2015. The aim of our study was to research the current state of the therapeutic muds. The sampling and processing were carried by standard methods [2].

Over the study period 123 species and intraspecific taxa of algae and cyanoprokaryota of 53 genera, 35 families, 26 orders, 12 classes and 7 divisions were identified. By the number of species divisions are the following: Aphanizomenon flos-aquae Ralfs ex Bornet & Flah., Euglena viridis Ehr., Cyclotella comta (Ehr.) Kütz., Diatoma vulgare Bory, Achnanthes minutissima Kütz., Gyrosigma acuminatum (Kütz.) Rabenh., Gyrosigma spenceri (W. Sm.) Cl., Amphora ovalis Kütz., Nitzschia recta Hantzsch ex Raben., Chlorella vulgaris Beyer.). In the therapeutic muds of the Usolka river oligosaprobionts, betamethasonesaprobionts and oligo-betamezosaprobionts dominated.

Therapeutic effects of mud are due to the combined action of closely related thermal, mechanical, chemical and biological factors. Depending on the physical and chemical composition of the mud, the severity of biochemical reactions of each of the factors will be different. The specific of the therapeutic effect of the mud is primarily determined by chemical and partly by biological factors. The mud application contained volatile substances, ions, steroid hormonal substances, humic acids and non-polar molecules of gases (chemical factor) penetrate the skin through the sebaceous glands and hair follicles. Algae and cyanobacteria are the main producers of biologically active substances of the therapeutic mud. Organic matter of mud chelate the ions of heavy metals, radionuclides and toxins, which leads to inhibition of their damaging histo effect.

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Flora of planktonic algae of the r. Usolka (Gafuriysky region Republic of Bashkortostan) in june 2014. (Флора планктонных водорослей р. Усолка в июне 2014г.)

The aim of our study was to describe the flora of plankton algae in Usolka river. The river originates in the western slope of the ridge Takata, 1.5 km to the north of the Mount Ayuly. It flows from the southeast to the northwest on the territory of Gafuriysky Region and flows into the river Belaya at 669 km from its outfall. The length – is 55 km, the basin area is - 380 square kilometers.

63 species and intraspecific taxa were identified. The species were grouped as follows: Bacillariophyta - 36, Chlorophyta - 14, Cyanoprokaryota - 6, Euglenophyta - 2, Xanthophyta - 2, Charophyta - 2, Heterokontophyta - 1.

Diatoms algae include 2 classes, 9 orders, 13 families, 16 genera and 36 species. More often than others we meet: Stephanodiscus hantzschii Grun, Synedra acus Kutz, Achnanthes minutissima Kutz, Navicula exigua (Greg.) O. Mull, Nitzschia acicularis (Kutz.) W. Sm. Green algae are represented by 1 class, 4 orders, 10 genera and 14 species. The most common were: Gonium pectorale Mull, Oocystis quadricauda lacustris Chod. Scenedesmus (Turp.) Brebisson. Ankistrodesmus Bern. Chlorella vulgaris angusyus Beijer. Cyanoprokaryota presented class 1, 2 orders, 5 genera. The kinds: aquatilis Sauv, Synechococcus elongatus Synechocystis Nag. Microcystis pulverea (H.C.Wood) Forti, Phormidium molle Gomont, Phormidium foveolarum Gomont. Euglenophytes presented only two species of algae Euglena viridis Ehr. and Euglena pascheri Swirenko.

The study of autotrophic plankton is of great interest for biodiversity assessment and monitoring of rivers subject to human impact, as well as forecasting and development of recommendations on conservation and the proper functioning of natural systems. In the formation of the species diversity of phytoplankton river Belaya Fragilariaceae family dominated. Genus Navicula was the usual dominant in the rivers.

According to the saprobity the greatest species diversity was characteristic of oligo betamezosaprobes. In the phytoplankton if the studied watercourse in June by galobility the greatest diversity of species was characteristic of oligogalobes-indifferent. In all watercourses oligogalobes - indifferent dominated. Depending on the sampling points the number of indicator species varied: at point one 14 demonstration species were identified (93.3%); at 2 - one (50.0%); at 3 - 3 (60.0%); at 4 - 5 (83.3%); at 5 - 8 (88.8%); at 6 - 3 (60.0%); at 7 - 5 (88.8%); at 8 - 6 (85.7%); at 9 - 7 (87.5%); at 10 - 16 (14.4%). Oligogalobes- galofobes were presented only at point 3.

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Die Arzneimittel und ihre Wirkung (Лекарственные средства и их воздействие)

Die Ätiologie von mehr als 50 % der Defekte beim Menschen ist nicht untersucht. Ein gewisser Teil davon wird durch Arzneimittel verursacht. Der Arzneimittelwirkstoff kann zu Fehlbildungen führen. Er hat eine direkte toxische Wirkung auf den Fötus nach Durchdringen der Plazentaschranke und somit Einfluss auf die Plazenta oder den mütterlichen Organismus. Fehlbildungen können vor oder nach der Geburt in Form von anatomischen, histologischen, zytologischen und biochemischen, neurophysiologischen Anomalien vorkommen. Toxische Schädigungen vom Embryo oder Fötus zeigen sich in Veränderungen des Körpergewichts, der Größe des Fötus, der Entwicklungsverzögerung und einer erhöhten Mortalität. Die Schädigungen am Nachkommen können die verschiedensten Formen annehmen. Das Erkennen von Nebenwirkungen durch Medikamente mithilfe von Experimenten ist von großer Bedeutung für den pränatalen Schutz des Ungeborenen. Durch das Untersuchen der Auswirkungen von Medikamenten auf die einzelnen Stufen der Reproduktion kann einerseits das Auftreten von Nebenwirkungen verhindern sowie andererseits klinische Versuchsbedingungen voranbringen. Aufgrund dessen sind Studien über den Einfluss von Drogen auf die Fortpflanzungsfunktionen von Tieren notwendig.

Um die Sterblichkeit vor der Implantation zu bestimmen, wurde die Differenz zwischen der Anzahl der Gelbkörper und der Anzahl der Implantationsstellen festgestellt und daraufhin berechnet, welchen Prozentanteil diese Differenz an der Anzahl der Gelbkörper ausmacht. Für die Bestimmung der Sterblichkeit nach der Implantation wurde die Differenz zwischen der Anzahl der Implantationsstellen und der Anzahl der Gelbkörper festgestellt und den Prozentanteil der Implantationen gerechnet.

Die Studie der Wirkungen von Dimethyl-Benzimidazolcarbaminsäure und deren Komplexverbindungen mit Kupfersulfat, BMK₂-CuSo₄ hat gezeigt, dass die orale Verabreichung von BMK, Bavistin und Carbendazim in der getesteten Dosis bei trächtigen Ratten in den ersten neunzehn Tagen das Körperwachstum negativ beeinflusst und die Sterblichkeit vor und nach der Implantation sowie die gesamte Embryo-Sterblichkeit erhöht. Die Verabreichung der Komplexverbindung BMK₂-CuSo₄ hingegen führt zu Nebeneffekten nicht. Demnach haben die beiden vorliegenden Verbindungen von Methyl-2-Benzimidazolcarbaminsäure starke fehlbildende Wirkungen.

Die Untersuchungen wurden mithilfe von modernen Materialen moderner Technologie in den Laboren des Lehrstuhls für Humanphysiologie und des Lehrstuhls für Zoologie und Biologie unserer Universität durchgeführt. Bei der Untersuchung wurden Komplexverbindungen mit Kupfersulfat verwendet.

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Features of reproduction of *Dendrobium nobile* Lind. (Orchidaceae Juss.) in *in vitro* culture (Особенности размножения *Dendrobium nobile* Lind. (Orchidaceae Juss.) в культуре *in vitro*)

Any plant cell is capable to implement the inherent totipotency, i.e. to give rise to a new plant organism under the exogenous influences. This unique ability of the plant cell is the basis of micropropagation.

Micropropagation technology is a perspective way of vegetative propagation of plants by which it is possible to obtain high-quality planting material free from viral, fungal and bacterial diseases [1]. There is a real opportunity to produce large quantities of vegetative offspring by using this method. It is especially essential in the case of decorative species of plants.

All the species of the genus Dendrobium have a rather high rate of vegetative reproduction, that allows us using it in *in vitro* culture.

One of the decorative representatives of this genus is *Dendrobium Nobile* Lind., which is widely used in traditional Chinese medicine. This plant is used as an invigorant for treatment of tuberculosis, anorexia, fever and dyspepsia [2].

The purpose of the work is to determine the optimal culture conditions for *D. nobile* to stimulate its shoot formation.

The explants of *D. nobile*, represented by one shoot with two leaves, were used for micropropagation. The explants were cultivated on a nutrient *Murashige* and *Skoog* medium, with the addition of 10 g/l sucrose, 3.5 g/l agar and different combinations of growth regulators: 6-benzylaminopurine, gibberellic acid, indoleacetic acid - 1 mg/l and 2,4-dichlorophenoxyacetic acid, 0.1 mg/l. As a control medium the *MS* medium without any growth regulators was used.

The measurements were performed after 8 weeks of cultivation. The number of shoots and leaves was counted. The results indicate that the formation of shoots and leaves depends on the ratio of different groups of growth regulators. In the course of experiments on the effect of growth regulators on shoot formation of *D. nobile* in *in vitro* culture a medium supplemented with BAP, IAA, 2,4-D was revealed as an optimal medium.

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α-Amylase inhibition by plant's polyphenols (Ингибирование α-амилазы растительными полифенолами)

The diabetes mellitus is one of the most common metabolic diseases in the world. It is known that about 9% of adult population suffered from diabetes in 2014. The great successes of diabetes's treatment have not led to reducing the prevalence and diabetes frequency is supposed to increase in the future.

The methods of diabetes treatment include the following: regulation of tissue sensitivity to insulin, the influence on insulin activity increase in specific tissue, for example, and inhibition of enzyme activity for reducing glucose rate in blood. The first and second ways involve a wide range of different method with using diverse synthetic drugs, which have a number of unwanted side effects. At the same time, the diabetes treatment with using specific α -amylase inhibitors allows reduce the glucose level without significant complications for the organism. For this reason, inhibition of α -amylase, which plays a key role in the digestion of starch and glycogen in blood, is considered as one of perspective strategies in the hyperglycemic treatment. There are many screening studies for finding effective α -amylase inhibitors, and at present, many countries have realized effective synthetic and natural chemical components, which are involved in pharmaceutical production for diabetes treatment. And medical plants are available and widely used natural resources for producing many of pharmaceutical products and functional foodstuffs, which are characterized by high biological activity and low side effect rate. Their properties are known to have many-sided effects, including inhibition of α amylase activity. These was found to have diverse inhibitors: peptidoglycans, alkaloids, polysaccharides and flavonoids. Besides, flavonoids are interesting, perspective and poorly understood objects in the α -amylase inhibition field. For these reason, the aim of our research is studying the influence of diverse flavonoids on α -amylase activity for creating new method of diabetes treatment.

In these research, we suggested that dihydroquercetin, catechin and rutin have inhibition effects and we decided to conduct the analysis amylolytic kinetics by measurement of the optical density of the starch in the presence of these compounds during the saccharification.

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Genetic basis of gastric cancer (Генетические основания рака желудка)

The gastric cancer (GC) is a malignant neoplasm which affects stomach and is dangerous because it can develop in any part of the stomach, and spread to other organs, especially to esophagus, lungs and liver. About 800 000 people die annually of this disease.

This disease is multifactorial, it affects the majority of organism systems. The conventional risk factors of gastric cancer development are the following: existence of *Helicobacter pylori* (*H.pylori*) infection

in an organism, smoking, excessive use of Sodium nitritums and table salt in nutrition, toxic substances, including radiation.

Associated diseases also influence the development of gastric cancer. People suffering from a peptic ulcer of a stomach or atrophic gastritis, are ill with this type of oncology more often than the average population. Relatives of patients with (GC) are also at the increased risk of development of this disease. It can be explained with existence of susceptibility genes. Among *CDH1*, *TP53*, *MSH2*, *ARID1A*, *FAT4 from* the candidate genes contribute to the development of RZh, etc. As a specific gene-supressor of a family gastric cancer we consider the gene of *CDH1* (*E-kadgerin*) which albuminous product participates in intercellular interactions and regulates activity of a β -katenin. Frequency of mutations in this gene makes up to 10% of all cases of the gastric cancer. The gene of *TP53* regulates a cellular cycle, an apoptosis, DNA reparation. Function of a gene of *MSH2* is in reparation of not coupled DNA sites.

In recent years researches with the use of a method of the Exome sequencing, as a result of which new pathogenic mutations are found in new candidate genes, such as *ARID1A* participating in the processes of remodeling of chromatin, *FAT4* which performs the function of a tumoral supressor etc. are most actual.

Currently the status of separate oncogenes or genes-supressors at a gastric cancer are so far known, but also the alternative alarm cellular ways participating in a gastric carcinogenesis are established. Thus, detection of the genes responsible for susceptibility genes to this disease frames new opportunities for medico-genetic consultation and primary prevention of this pathology.

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ГУМАНИТАРНЫЕ НАУКИ (ФИЛОСОФИЯ, ФИЛОЛОГИЯ, КУЛЬТУРОЛОГИЯ)

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Peculiarities of Russian proper names translation into English (Особенности передачи русскоязычных имен собственных на английский язык)

In this paper we will focus on peculiarities of translation of proper names from Russian into English, based on Russian cartoon series «Smeshariki».

The anthroponym is a proper name (or set of names), officially assigned to the individual person as his identification. Translation of proper names from one language into another is an important and actual problem.

When an interpreter translates proper names into a foreign language he has a difficult task: it is necessary to reflect their cultural and national identity accurately, to preserve their sound shell.

The material of this work is a Russian animated series «Smeshariki». The goal of our work is to examine the motivational signs creating the names of the main characters in the original language and to reveal the peculiarities of translation of these names into English.

The names of these characters in most cases are semantically transparent. In the series the characters of three age groups present - adolescents (Krosh, Yozhik, Nyusha, Barash), adults (Losyash, Pin), elderly (Kar Karych, Sovunya, Kopatych). The basis of the names of the Yozhik, Barash, Losyash, Sovunya and Pin (penguin) is a motivating sign of belonging to a particular group of animals. The motivating basis of Kar-Karych is the onomatopoeia. Bear-gardener Kopatych got its name from the verb denoting the main activity - "digging". The exception is the name of the only girl of the cartoon - Nyusha, which is derived from the anthroponym Anna.

We have analyzed variants of their names translated in English and their motivating signs. Barash became Fluff. (from English «fluffy»), the motivating feature is the appearance of the character, who is similar to the ball of fluff. Krosh – Jumpy, the name, formed from the participle «jumpy (skipping)», which perfectly describes the main abilities of a rabbit. Yozhik – Joshy, that was formed by the sound of his Russian name «Yozhik». Nyusha – Pinky, i.e. «pinkish». Sovunya – Olga. It was formed by replacement name, i.e. Olga is consonant with the word «owl» and also the name Kar-Karych – Carlin, it was formed by the prefix «car» likens the sound of the crows «CAW-CAW». Pin – Pin. It was formed by truncation from the word «penguin». The Kopatych – Berry. «Berry» means «to gather berries», which also describes the occupation of the bear- gardener. And the name of Losyash – Eldoc, formed by adding the bases «doc (doctor) », because in the cartoon he's a moose-scientist who deals with many Sciences.

So, we see when we translate the proper names into English motivational signs of a name change, due to phonetic and cultural features. © Артамонова Ирина, 2016

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To the Problem of the Situation in Modern British Society (К проблеме о ситуации в современном британском обществе)

In the light of the recent political and geopolitical changes in the world, I would like to say a few words about the tendencies in modern British society.

For many centuries Britain occupied a special and unique position in Europe, at least because of its island location. The United Kingdom continues this tradition today. It is a member of the European Union and NATO but, at the same time, it has managed to preserve a number of key benefits: its own monetary system, the autonomy of the armed forces, the primacy of national legislation in the field of migration, etc. The British government actively manipulates the possibility of an exit the EU, thus achieving more benefits. In view of centuries-old traditions, British subjects are accustomed to consider themselves not just the bearers of European culture, but mainly British people.

Despite all the facts mentioned above, there is one common European problem, which the UK failed to avoid – it is the problem of illegal migration. Unemployed migrants are not only destroying the economy of the country but they also cause heated discussions in British society. Rightists, in the face of such organizations as, for example, Britain First, advocate for the expulsion of all those who failed to assimilate to the British reality. Leftists, the Communists blame the imperialism that caused the sequence of wars in the Middle East, and they urge to take refugees who, in their opinion, are victims of British policy.

Not every country in the world can accommodate thousands of people, who do not intend to assimilate into it. We can fully agree on this issue with the soft-right members. The European policy of multiculturalism was a failure; it was noticed by the Europeans themselves, for example, even by Angela Merkel. But, at the same time, in Britain as in other European countries right-wing ideas, even quite reasonable and competent are associated with fascism, as a result they are often denied without proper analysis. Concerns about the revival of fascism in itself is an excellent phenomenon, but if it is brought to the absolute, it can lead to the events that took place, for example, in Rotherham. The passivity and the fear of the autochthonal British population, gives something like permission to migrants to commit any actions.

If the British want to preserve the United Kingdom as it was known earlier, they will need to develop a clear and systematic position in relation to this cultural and civilizational problem. To invite everybody to your own country is great and noble, but if people are not entirely committed to respect British traditions, can they stay in Britain? If they are allowed to stay, then Britain itself has changed beyond recognition. If they are not, then the era of heated public debates in Britain is just beginning, and only time will show whether the country will find the way out of it.

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Mythologische Metapher in der schöngeistigen Literatur (Мифологическая метафора в художественной литературе)

Metapher ist ein sprachliches Bild bzw. eine poetische Stilfigur, die häufig zur Veranschaulichung von Sachverhalten oder Gefühlsregungen dient. Zumeist wird die Metapher als eine Form des bildhaften Sprechens bezeichnet, bei der die Wörter nicht in der eigentlichen, sondern in übertragener Bedeutung verwendet werden.

Hauptmerkmal der Metapher ist die Beziehung der Ähnlichkeit (Analogie) zwischen dem wörtlich Gesagten und dem übertragen Gemeinten, im Unterschied zu anderen Tropen, die zum Beispiel eine Beziehung der Nachbarschaft oder Kontiguität (Metonymie), zwischen Besonderem und Allgemeinen (Synekdoche) oder der Kontrarietät (Ironie) aufgreifen.

Metaphern werden vorwiegend aus den folgenden Gründen gebraucht:

• weil für die gemeinte Sache kein eigenes Wort existiert;

• weil ein existierendes Wort oder die bezeichnete Sache als anstößig gilt oder negativ bewertet wird und deshalb durch einen unverfänglicheren Ausdruck umschrieben werden soll.

• weil ein abstrakter Begriff durch einen anschaulicheren Sachverhalt versinnbildlicht werden soll;

• weil diejenige sachliche Eigenschaft, auf der die Ähnlichkeit beruht, besonders hervorgehoben werden soll.

Obwohl Metaphern dieser Art bereits in der Umgangssprache und der nicht-literarischer Sprache eine wichtige Rolle spielen, ist der Einsatz gesuchter, auffälliger, einprägsamer und manchmal auch absichtsvoll rätselhafter oder dunkler Metaphern ein besonderes

Merkmal literarisch kunstvoller und poetischer Sprache, wodurch sie sich vom normalen Sprachgebrauch abheben.

Das **Hauptziel** der Arbeit ist das Studium der Übersetzungsverfahren von mythologischen Metaphern in der schöngeistigen Literatur an dem Beispiel der Romane von Nathaniel Hawthorne.
Ein Großteil der Forschung behandelt die Fragen des hermeneutischen Potentials, der pragmatischen Funktion und der metaphorischen Bedeutung bildlicher Formen in den schöngeistigen Texten (Metapher, Symbol, Allegorie) in den Romanen von Hawthorne.

Die Frage der metaphorischen Bedeutung in den schöngeistigen Texten ist auch von großem Interesse. Aber diese Frage und die Übersetzungsprobleme sind noch sehr wenig untersucht. Dann kann man die **Aktuälitat** dieser Arbeit eklären.

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Invented languages in English-language literature (Вымышленные языки в англоязычной литературе)

Invented language is a sign system created from the elements of the natural languages to be used as auxiliary means of international communication.

The invented language which is used in literature as its characters' communication means is called fictional language.

Some elements of fictional languages always exist in literature. They include any terms created by authors such as the names of the rivers, countries, towns etc.

Fictional languages are used to serve as artistic details in the literature works. With the appearance of the utopia genre fictional languages become a significant part of a fictional setting. The name «utopia» comes from the work by Thomas More («Utopia», 1516). The book was written in Latin and the fictional «utopian» language was based on the Greek roots because at that time, in the Renaissance, Latin was the language of the intellectual elite and the antiquity was considered as the ideal. Thus the Latin language of narration and the utopian (Greek) language created an image of Utopia as a perfect, ideal country.

The utopian ideas can be found in the «Gulliver's Travels» (1726) by Jonathan Swift. In the fourth part of the story Gulliver found himself in the country of the Houyhnhms, reasonable and virtuous

horses. The language of the Houyhnhnms was a parody of horse neighing. Swift overemphasized this link. For example the absence of the concept «lie» in the language of the Houyhnhnms was a reason of their disability to understand jokes and metaphors.

J.R.R. Tolkien, the author of «The Lord Of the Rings» (1954– 1955) paid special attention to the fictional languages. Tolkien described more than twenty fictional languages. Each of them had its own history and culture. They perfectly reflect the way of thinking of their speakers. Tolkien's languages had been developed and described so well that they began to spread beyond the world of his books. Nowadays the Middle-Earth languages are the most popular fictional languages for studying.

In the XX century the genre of dystopia finally formed. G. Orwell in his work «1984» (1949) described the fictional language «Newspeak» which was formed from the English language (oldspeak) by reducing and simplifying its vocabulary and grammar rules. In this book the language became the weapon of mass mind control. With the help of newspeak the power of Oceania sought to suppress the people's ability to think.

To sum up we can say that the fictional languages have always existed in literature as the artistic detail but the further development they've got in such genres as utopia, fantasy and dystopia.

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Analysis of the concept of beauty in the Russian language (Анализ концепта «красота» в русском языке)

In this article we are going to get acquainted with the scientific notion of "concept" and pay special attention to the concept of beauty in the Russian language.

Concept can be understood as a mental formation, which possesses a specific cultural value, and represents elements of the world for people in the course of reflection and communication (Neroznak, 2008). Among all concepts, the concept of beauty, in my opinion, is one of the most interesting, because it gives us a great opportunity to turn to national aspects of people's picture of the world, reflected in the languages. To determine the conceptual aspects of the concept of beauty in the Russian language we studied explanatory articles for several entries in the explanatory dictionaries of the Russian language by Ozhegov (two authors), Shvedova (1986), Ushakov (2003), Dahl (1995, 2005). The analysis of the article dictionaries showed that the main meanings expressed by the concept are:

- a characteristic feature, ornament, delight;

- something that gives pleasure and joy to the senses (vision, hearing) or mind;

- an abstract notion;

- attractiveness due to pleasant appearance or inner world

These characteristics are the conceptual core of the concept "beauty" in Russian.

Other features make up the periphery of the conceptual core of the concept "beauty", such as:

- beauty as an interjection expressing feelings;

- beauty referring to a girl;

- beauty as a young female;

- beauty as the braid of a girl.

According to the survey of Russian respondents, most Russianspeakers defined "beauty" as harmony, a kind of feature that causes a person to experience positive emotions, satisfying the aesthetic needs of the person. When asked what might be beautiful respondents often mentioned a person's appearance, nature, or works of art. The difference can be explained by mentality of the people, their culture, but still we see that vision of beauty is highly individual.

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Interaction of religious and moral values in the process of communication (Взаимодействие религиозных и нравственных ценностей в процессе коммуникации)

The religious consciousness from the very beginning of its existence was aimed at understanding and explanation of the world. At the same time it also actively influenced the inner, spiritual world, forming the religious views and beliefs, moral standards and ideals of a person.

If morality and religion for a believer are inseparable notions, for a secular researcher certain social and historical conditions and the interests of society or class constitute basic principles of morality. As a rule, religion as a way of the spiritual development of the world is formed in the process of reflection of reality, but does not appear as an arbitrary fiction, as well as commandments include only the result of moral consciousness of society.

In the framework of this approach the question of the moral motives of the person arises. If under the «God's will» the interests of certain classes, justification or condemnation of those or other actions are meant, the service of God is the service to certain groups of people. Besides, the implementation of the requirements of morals for fear of heavenly punishment allows a person to hope on God's mercy through formal following the established standards and principles.

Morality, along with religion, ensures harmonious interaction among members of society, affects its integrity and it is one of the oldest and most important regulators of public relations. The only difference between morality and religion is that religion has no special merit before history and humanity in the development of moral ideas, requirements and standards.

In the context of religious revival in Russia, the process of social communications requires to follow both moral and religious values, which, in turn, will actively influence the spiritual world of an individual, and the whole society.

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The Phenomenon of Doppelganger in the literature (Феномен двойничества в литературе)

The phenomenon of Doppelganger (ambivalence, ambiguity, ambivalence, dichotomy, bifurcation) takes a special place in literature. It is expressed through the categories of duality. The doppelganger phenomenon is the archetype of culture and structure of the artistic language, in which the human image is adjusted by one of the historical variants of binary (dual) model of the world. This phenomenon is realized in the narrative and reveals itself not only on the level of the plot in the form of a certain system "doubles – characters", but also on the level of genre, forming a unique "minimal" model of society – "one – the other", capturing both the similarities and differences. The researchers consider the doppelganger phenomenon in connection with the characters system.

From the literary history point of view the phenomenon traces its roots back to the age of ancient mythological systems. It's closely connected with the dual structure of ancient societies, as well as with the widespread myths about the twins.

The doppelganger phenomenon reveals itself essentially opposite in the world literature: firstly, as a soul twin, guardian and protector, and secondly, completely opposite, the pratagonist, the embodiment of evil and a sign of impending disaster. The opposition and contrast of the main characters in literature may be observed in absolutely different spheres: psychological, moral, social, age or metaphysical.

The doppelganger phenomenon begins to assert itself most clearly in the romantic period (19th century), which is associated with the double world conception and the tragic world's vision. Many authors (especially in romantic and postmodern periods) wrote about twins and doubles: Edgar Allan Poe, Robert Stephenson, Daniel Keyes, Chuck Palahniuk, etc. The phenomenon of doppelganger determines the poetics of these works on the level of form and context. "Dual models" which reveal the philosophical basis of this phenomenon are regarded in their prose. The motive of doppelganger is presented as a contrast of light and darkness – both in the outer and inner space.

In conclusion it should be mentioned that duality is an ancient universal model of artistic research of human's place in the society, which is based on the binarity as a fundamental principle of designing the world by the person's consciousness.

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The "Russian theme" in the context of historical and mythological treatment of reality interpretation («Русская тема» в контексте историко-мифологического подхода к интерпретации действительности)

The "Russian theme" will sound with special severity and will inherently symbolize the return to the sources of the artistic tradition.

In music it will address the traditions of Russian choral singing, chants (music byA.T. Grechaninov, S.V. Rakhmaninov, A.N. Cherepnin, A.D. Kastal'skii).

In picturesque art there will appear A.V. Lentulov's popular prints; three-dimensional images of traditional folk heroines – the tradeswoman by B. M. Kustodiev, the picturesque dance girls by N.Ya Simonovich-Efimova; Russia -brisk and rife with colors – in N.K. Rerikh's pictures.

Literature will compliment the world with a range of highest rank poets. The beauty of Russia, its churches and landscape, folk origins and the dream of the "peasant's paradise" is praised by S.A. Esenin, N.A. Klyuev, S.A. Klychkov. The aesthetic of the new art as a declaration of real beauty and harmony to a large extent was defined by the creative association of the "silver age" –the association of talented representatives from various art movements "The world of art" (Mir iskusstv).

The artists tried to pass over the layout of the old-time Russian architecture, the beauty of the Russian nature, the life of Russian provincial villages in interesting, sometimes extremely forwardlooking forms (through fluidity of forms, special conciseness of silhouettes, dynamism of compositions, symbolism of the vivid systems, allegory).

We can see the samples of ornamental styles of modern in architecture as well. Fine art experts directly determine the expression of such fixation in a particular interest in ornament, ornamental sculptural art, and embodying into the general artistic space of ceramics, mosaic, stained-glass windows.

As R.P. Trofimova points out, like the religious renaissance of the beginning of the 20th century, modernism in all its expressions "make it its mission to revive the self-value and self-sustainability of art and culture, to make them free from social, political or some other official function.

Modernism at the same time stood against utilitarianism in treatment of art and against the artistic trend of academism ... the prescription of artistic culture lied in searching for new forms, new methods and mediums...". But even the first ideologists of modernism called for perception of everlasting spiritual values, morality as the supreme goal of cultural evolution (D.S. Merezhkovskii).

Modernism made another attempt to comprehend the basics of Russian life. Appearance of modernism did not mean annihilation of quivering humanistic thought of the Russian art which continued with the traditions of predecessors.

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Die synergetische Behandlung in der Linguistik (Синергетическое направление в лингвистике)

In der letzten Zeit ist die Neuaufstellung des postnichtklassischen Weltbildes in der Wissenschaft kennzeichnend, dabei zeigt man regstes Interesse an die interdisziplinäre Richtung, die als "Synergetik" bezeichnet ist. Es gibt viele Monographien, Lehrbücher, Artikel, viele Konferenzen haben diesen Problemen ihr Interesse gewidmet. Dieses Fachwort ist so geläufig geworden, dass die Fachkräfte dieses Fachwort in den unerwarteten Kontexten gebrauchen ohne zu verstehen. Man kann über das synergetische Paradigma, über die synergetische Richtung in den Problemen der Staatssicherheit, über die synergetischen Grundsätze der Ausbildung usw. sprechen.

Die Synergetik ist eine junge interdisziplinäre Forschungsrichtung, die von Hermann Haken vor allem auf der Basis seiner Forschungen zum Laser begründet wurde [3].

Haken erklärt, dass die Synergetik die Systeme forscht. Unter "System" wird ein Forschungsobjekt verstanden, das aus mehreren unterschiedlichen Elementen zusammengesetzt ist, die bestimmte Eigenschaften besitzen und untereinander durch angebbare Relationen verknüpft sind. Diese Relationen verkörpern die dynamischen Abhängigkeiten, die aufgrund von Mechanismen zwischen den Systemelementen bestehen. Diese Systeme können die Objekte der verschiedenen Wissenschaften sein, zum Beispiel Physik, Chemie, Biologie, Ökonomie, Soziologie, Linguistik usw. Die Synergetik interessiert sich für allgemeine Gesetzmäßigkeiten von Evolution dieser Systeme. So auf einem Plan ihres Schöpfers spielt die Synergetik eine Rolle der Metawissenschaft, und studiert die allgemeinen Abhängigkeiten, die private Wissenschaften als "ihre" anerkennen [1, 214-215].

Allerdings erforscht die Synergetik nicht alle Systeme, aber eine bestimmte Klasse von dynamischen Systemen. Dynamisches System ist jedes System, das im Laufe der Zeit weiterentwickelt, die Zusammensetzung der Komponenten und die Beziehungen zwischen ihnen ändert und die Funktion beibehaltet, i.e. jedes System, das in der Zeit unter dem Einfluss von äußeren und inneren Kräften seinen Zustand verändert. [2]

Zusammen mit anderen Wissenschaften änderte sich Linguistik auch zusammen mit ihren Paradigmen. Die synergetische Linguistik betrachtet die Sprache als ein dynamisches System. Sie geht also davon aus, daß in der Sprache aufgrund äußerer Einflüsse Prozesse ablaufen, die zu Veränderungen von Systemgrößen oder der Systemstruktur führen.

Zur Umwelt des Sprachsystems gehören soziale und kulturelle Systeme. Damit die Sprache dieser dynamischen Umwelt gerecht werden kann, muß sie ebenfalls dynamisch sein. Dafür benötigt sie inhärente Selbstorganisations- und Selbstregulationsmechanismen.

Die synergetische Linguistik erlaubt es, Forschungsergebnisse (Sprachgesetze) und Erklärungsansätze (Funktionalanalyse) der quantitativen Linguistik in einen umfassenden Rahmen zu stellen und damit wissenschaftliche Erklärung und Vorhersage zu leisten.

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The Role of Culture in the Communication Process (Роль культуры в процессе коммуникации)

Culture is the product of the interaction between universal biological needs and functions, universal social problems created to address those needs, and the context in which people live. Culture is created as people adapt to their environments in order to survive, and it results from the process of individuals' attempts to adapt to their contexts in addressing the universal social problems and biological needs.

Culture influences all aspects of our lives. It involves subjective – attitudes, values, beliefs, opinions, behaviors – and objective – clothes, food, utensils, architecture – elements (Triandis, 1972). Cultures provide rules for living, telling people how to interact, work and play with each other.

Different cultures have developed different ways of dealing with biological imperatives and universal social problems based on their contexts. Language is a good example of a very culture-specific behavior. Each culture has its own language? with its own vocabulary, syntax, grammar, phonology, and pragmatics. The need to have language may be a pancultural universal problem; and having a language may be a universal solution to this problem. But the specific way in which each culture solves this problem – that it develops its own language – is different in every culture.

Communication involves both verbal and nonverbal behaviors, and culture influences both.

Different cultures have different languages, and subcultures have dialects within a language. Each is a unique symbol system that denotes what a culture deems important in the world. That words exist in some languages and not others reflects the fact that different cultures symbolize their words differently. For example, Eskimo language has three words for snow while English had only one.

That the relative contribution of nonverbal behaviors to the communication process is larger than that of verbal behaviors is a given in the field today. As with verbal language, culture influences nonverbal in profound ways. The largest research is related to facial expressions of emotion, gestures and gaze. Thus, it was suggested that affiliative aspects of gazing begin in infancy, because infants are very attentive to adults as their source of care and protection. Cultures create rules concerning gazing and visual attention, because both aggression and affiliation are behavioral tendencies that are important for group stability and maintenance. Cross-cultural research has well documented differences in these rules.

Thus, the influence of culture on communication process is undeniably large. And yet, we cannot ignore the universal bases for many nonverbal behaviors that cut across cultural differences.

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Literary authentic text as means of training for the United State Exam in the English language (Аутентичный художественный текст при подготовке к ЕГЭ по английскому языку)

Nowadays the problem of students' training for the United State Exam (USE) in the English language is very important. We regard the authentic literary text one of the means to be used as the training for it.

In the scientific literature an authentic the text has been created in order to fulfill certain social functions of the language community where it was produced. According to the educational process of learning foreign languages an original (authentic) text can be considered as a text that does not take the objective conditions stage of learning a foreign language. It is created by native speakers and it is a part of an extensive oral or written information addressed to native speakers and culture.

The authentic text reflects the facts and features of national culture. Through such a text, students learn new knowledge, values, so the cultural competence. The text reflects the real life that provokes students' interest to take part in a discussion. That's a necessary point for using the text for the studying while getting ready for the USE in the English language.

There are several criteria for selection of literary authentic texts, that should be taken into consideration within the process of drilling students for the USE. They are:

• criterion of literary and aesthetic significance of the text;

• criterion of the relevance criterion, a text must be meaningful to the students filled with facts, problems and issues;

• criterion of continuity of the test involves continuous training with other aspects of learning (speaking, writing);

• criterion of saturation includes a description of the cultural facts, language, traditions and customs;

• criterion of obligatory determines the selection of a minimum of information about works of literature, history, art.

There are three main steps of work with literary authentic text for the exam in a foreign language:

1. Pre reading

2. While reading

3. After reading.

Each of the steps contains the special complex of exercises the usage of which will help to take the exam successfully.

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The Seals of Bactria and Margiana: Overview of Art Styles (Печати Бактрии и Маргианы: обзор художественных стилей)

The Bactria-Margiana Archeological Complex, or «BMAC», also known as «Oxus civilisation» is the modern archeological designation for a Bronze Age civilisation of Central Asia, dated to ca. 2300-1700 BCE⁶, located in present-day northern Afghanistan, eastern Turkmenistan, southern Uzbekistan and western Tajikistan, centered on the upper Amu Darya (Oxus River).

Its sites were discovered and named by the Soviet archaeologist Viktor Sarianidi (1976). Bactria was the Greek name for the area of Bactra, in what is now northern Afghanistan, and Margiana was the Greek name for the Persian satrapy of Margush.

Sarianidi's excavations from the late 1970s onward revealed numerous monumental structures in many sites, fortified by impressive walls and gates. Reports on the BMAC were mostly confined to Soviet journals, until the last years of the Soviet Union, so the findings were

⁶ Сарианиди В.И.Древности страны Маргуш. – Ашхабад, 1990. – С.24.

largely unknown to the West until Sarianidi's work began to be translated in the 1990s.

One of the most important archeological finds is metal, stone, ceramic seals and amulets. All pieces with a handle or a loop in the middle of the back are considered to be seals: amulets have a perforation (sometimes two perforations) for a cord.

All findings identified by V.I.Sarianidi as seals or amulets have own unique art plot. I think the origins of seals and amulets decoration from Bactria and Margiana need to be found in Mesopotamia. This thesis is confirmed by several facts. The first argument: population, which became the main of BMAC, in the IVth millennium migrated from the region of Anatolia to the north of Mesopotamia. Reason of migration is xerothermic period in the middle IV mil.BC in the territory of the Eastern Mediterranean to the Iranian plateau⁷. Part of the migrants have settled in the territory of Mesopotamia, the Tigris and Euphrates - in Akkadian and Elamite kingdoms. However, the a protracted character of drought has resulted to long waves of migration from the Mediterranean area, that ultimately led to the colonization of the southern areas of Central Asia and the emergence of Margush. The second argument: most of the seals and amulets anyway repeat a Mesopotamian Art styles, such as griffins, winged deity, laceration scene, and the manner of image of the human.

Today, there is a classification of seals and amulets, developed by Victor Sarianidi. It includes six groups of images: the anthropomorphic; serpents and dragons; fabulous creatures; animals and birds; arthropoda and plants; individual seals and amulets. In its turn groups divided on the basis of individual images: serpents, dragons, lions, birds, bulls, acrobats, deities, and other.

The seal was a mark of personality, a kind of a particle of its owner and imprint of a seal secured some mystical constant presence of its owner. Perhaps seals and amulets served as monetary unit, but this is just a hypothesis.

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Term fable in Russian and Foreign literary studies (Термин фабула в русском и зарубежном литературоведении)

In the Russian tradition, there is no commonly accepted definition of the term fable («fabula»). This term originated from the Latin language and is translated as a story, a narrative. Most scientists believe that the fable is the factual part of the narrative, the events, incidents, actions, conditions in their cause-chronological order, arranged and formed by the author on the basis of the laws, the author sees in the development of the described events. Such understanding of the term was common in the literature of formal school representatives from 1910 to 1920 (V.B. Shklovsky, Yu.N. Tynyanov, B.V. Tomashevsky). In Russian, the term plot is derived from the French word «sujet» and is translated as "subject". Plot is an event or set of events in the epic and dramatic works, the development of which allows the writer to reveal the essence of the characters and events described in accordance with the author's intention. Plot is driven by conflict.

In the foreign tradition fable is a short story illustrating human tendencies by means of animals as characters. Unlike parables, fables often include talking animals or animated objects as main characters. The interaction of these animals or objects reveals general truths about human nature, i.e., a person can learn practical lessons from the fictional antics in a fable. However, unlike parable, the learned lesson is *not* necessarily allegorical. Each animal is not necessarily a symbol of something else. Instead, the reader learns the lesson as an example of what one should or should not do. In the Russian literary studies, we call it "basnya".

In foreign literary studies the notions "plot" and "story" are used as synonyms (Russian «fabula» and «sujet»), not as different terms. The term plot combines these two concepts. Plot is the structure and correlation between actions and events in a work of fiction. In order for a plot to begin, some sort of catalyst is necessary. While the temporal order of events in the work constitutes the "story," we mean plot rather than story, but as soon as we take into account the way the events correlate between each other and the way how they are represented and organized to achieve particular effects, we mean story.

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Infinity and finiteness (Бесконечность и финитность)

There are two main points of view on the world's borders. It is believed that it's either infinite or finite. Many philosophers saw it infinite. The concept of infinity was first used by Anaximander. He thought that the origin of all things was the beginning of an endless Apeiron, permanent and indestructible. Leibniz and Kant also believed that the universe was infinite. Hegel distinguished several kinds in infinity. The dialectical materialist also thinks that the world is a matter in motion which is eternal and infinite. Finiteness is a limitation of objects, processes, phenomena in space or time. It also means temporarity and transience of all things. Finitism is a doctrine that denies the concept of infinity. Finitism adherents believe that the use of the term "infinity" is unacceptable when describing real, material objects or systems. The concept of infinity falls into the mental human world, firstly because of the religious beliefs, secondly because of the philosophic theories, and thirdly from mathematics.

Both views are opposed to each other and are extremes. They can be considered as thesis and antithesis. There is also a synthesis of infinity and finiteness. It was suggested by the Czech mathematician Petr Vopěnka. He created an alternative set theory (AST). According to Vopěnka, a man in the surrounding world does not see a clear set of elements. For instance, a set of stars in a galaxy, a set of sand grains on a beach and so on - set of fuzzy. A problem of fuzzy sets appears because all objects are different and no two are alike. Only conditionally we think that "two apples are roughly the can be put together." The main idea of AST is to entrust the fuzzy sets the role played by the concept of "infinity" in the classical mathematics. Therefore, Vopěnka's alternative infinity is something vaguely finite, so AST has no place for the paradoxes of classic set theory.

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Assimilation of Japanese borrowings in the English language (Ассимиляция японских заимствований в английском языке)

English language is known as the language of borrowings. There are a lot of loanwords from different languages like Greek, Latin, French and German, Arabic, Chinese, Japanese and others in it. Japanese borrowings constitute a significant part of the English language (0,2%) in which they undergo the process of assimilation.

Japanese language has three types of script: hiragana used for auxiliary parts of speech, katakana used for borrowed words, and characters used as content words. That is why the first step to assimilate Japanese words is latinization of Japanese characters.

There are a lot of varieties of Japanese words latinization, but the most widely used is revised Hepburn's system which is based on the English phonology. It does not follow the rules of Japanese spelling and makes a reproduction of real sounding of Japanese syllables, irrespectively of their location in kana's table (syllable \supset is situated in a line "ta" and a column "u", that is why it should be written as "tu", but in

Japanese language this syllable sounds like "tsu", and in Revised Hepburn it is written as "tsu", $\neg t_{\partial} - t_{\partial}$ – tsunami).

The next step is the phonetic assimilation of Japanese words. It is manifested in disappearance of long vowels in Japanese words (kendou – kendo, sumou – sumo). Japanese words acquire in English the only stress (活花 – ikebana - ,iki'ba:nə) and falling out of unstressed vowels in the process of assimilation makes Japanese words sound more familiar to the English spelling and pronunciation (junrikisha → jinricksha → jinriksha → ricksha → rikshaw → rikisha).

The third step is the grammatical adaptation of Japanese words. There are no plural forms in the Japanese language, but in English all countable Japanese borrowings get plural forms (geisha – geishas, ki-mono – kimonos). Japanese words acquire new forms with the help of affixes typical for English (Shinto – Shintoism, judo – judoist). Sometimes Japanese borrowings change their parts of speech (the word "hon-cho" was borrowed in 1947 in the meaning of "the leader of small group", but in 1964 the verb "to honcho" was formed from this noun in the meaning of "to be responsible").

One more step of assimilation is the semantic adaptation of words. In most cases Japanese words do not change their meaning in the English language, but there are some cases when the meaning was changed, e. g. the word "kamikaze" was borrowed with the meaning of "natural disaster", after the World War II it changed its meaning to "Japanese suicide bombers", now this word has the meaning of "reckless person".

To sum it all up Japanese loanwords undergo different types of assimilation in English.

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James Joyce's Epiphanies (Эпифании в творчестве Д. Джойса)

James Joyce's Epiphanies are dialogues and sketches that demonstrate the importance of the genre from the earliest stage of the author's literary development. Joyce gave the name epiphany to certain short stories he wrote between 1898 and 1904, and the idea of the epiphany was practically central to all his works.

Due to different points of view the word «epiphany» has several definitions. It is derived from Greek in the meaning of a sudden manifestation of deity. In Christian theology, it also means the manifestation of a hidden message for the benefit of others, a message for their salvation. Feast of the Epiphany is celebrated in the Christian calendar on 6 January each year, and it commemorates the revelation of Jesus' divinity to the Magi, the three wise men who had followed the star to Christ's birthplace. Joyce himself never defined exactly what he meant by epiphany, but a reader gets some idea of what it means from Stephen Daedalus' definition: «the revelation and importance of the subconscious had caught his interest», given by him in *Stephen Hero*.

Epiphanies are regarded as weak shades of a normal poet's work. They are conceived as a creative ingredient without any claim to publication. We encounter unfinished fragments of conversations, a number of emotional situations, the simplest sketches. Later Joyce mentioned the humorous intention to send his drafts to all the libraries worldwide. However, despite the fact most of these fragments are colourful and expressive, they are imbued with strong philosophical veins inside.

Joyce wrote about 70 epiphanies, but only 40 of them have survived. They are all small in volume (a few sentences) and represent a valuable material for those who want to comprehend the work of James Joyce in its full extent. Epiphanies show the establishment of a vital and creative position of Dublin writer, the beginnings of his artistic talent. In future, these sketches are found not only in the *Stephen Hero*, but also in *A Portrait of the Artist as a Young Man*, as well as in *Ulysses*,

which confirms their genuine significance in the creative life of the writer.

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9/11 literature: definition and variety of genres (Литература 11 сентября: определение и жанровое разнообразие)

2016 is the year of the 15th anniversary since the tragedy hit the Twin Towers in New-York and the Pentagon in Washington. This disastrous event has inspired a great number of writers and poets whose works are in the focus of the given research.

In general 9/11 literature is defined as «all the literary works in which the plot is informed by the 2001 attacks in New-York and Washington D. C., as well as subsequent related events (the «war on terror», the bombings in European cities etc.)» [according to M. Borges].

There is a tendency to subdivide 9/11 literature into «9/11 literature» and «post-9/11 literature». The former has an aim to describe and try to explain the moment of the tragedy itself while the latter pays attention to the aftermath and changes in people's lives as individuals and as the members of society.

«9/11 fiction» means the mixture of history (true events that took place on the 11th of September used for creating the plot of the story) and literary fiction (in creation of characters and other images surrounding them) to convey the importance of this day, this tragedy, and analyze the produced effect.

One of the key problematic points in defining the 9/11 literature phenomenon is connected with the great variety of literary works of different genres with their peculiar characteristics. According to A-J Aronstein, «9/11 literature» is a catchall term for description of too many types of books».

Within the non-fiction 9/11 literature is presented in the following genres: documentary literature (reports, reports in graphic adaptation); journalism (articles, publicist books); memoires. In «9/11 fiction» the central epic genre is a novel. There are a large number of novels about the 11^{th} of September 2001, they depict the fact information differently: in some of them the tragedy takes the central place, in others it is used as a background for the main acts, there are literary works where the attention is paid to the post-problems of 9/11 without mentioning the day itself, or novels that have a mission to completely rewrite that day. 9/11 literature is also presented in epic fiction genres of short stories collected into numerous digests. Within lyrical genres 9/11 is described in poems, sonnets, epigrams, elegies, songs. In drama genres there are different plays; the most common types are obviously tragedy and drama, with rare exceptions of comedies. All these forms of literary works reflect 9/11 events in their own peculiar way.

The tragedy in the Twin Towers and the Pentagon depicted in so many different genres shows its scale for all the humanity and the importance of this topic in literature.

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Absurd in social philosophy (Абсурд в социальной философии)

In modern social philosophy the problem of absurd is very noticeable. By absurd we mean the limitations of human cognitive abilities, which make it difficult to figure out the meaning of phenomena and events in the society. In the 20th century people faced two world wars, totalitarian regimes, the formation of a new scientific picture of the world, changes in social reality. It was the time of social contradictions, crisis, critical stage of society evolution. Most people came to the idea of absurdity of both the world, and human existence, as the surrounding reality stopped being comprehensible. Traditional values, attitude to the church, the old idea of family values slowly descended into the past, but they weren't replaced by new, explicitly shaped ones, accepted by the majority. In this case, the absurd is the inconsistency in the social sphere, the senselessness of the things happening. The philosophers of the last century, especially the existentialist philosophers began to understand new reality, looking for the way out of this situation. The study of the problem of absurd in the social structure and social phenomena draws attention to the diversity of absurd and its special role in the development of the modern society.

In philosophy, "the absurd" refers to the conflict between the human tendency to seek inherent value and meaning in life and the human inability to find any. In this context absurd does not mean "logically impossible", but rather "humanly impossible". The absurd causes conflict that can be resolved by reducing negative impact of absurd on the social environment, that is by involving human into communication, an intentional dialogue with other people. To lower the absurdity level, it is necessary that the social relations and all the life spheres should cooperate with each other, so that the main social institutes could function and perform their duty efficiently, i.e, it is needed to change fundamentals leading to the absurd. The absurd level will be lowered if people begin to realise their deeds and consequences, only after setting a target, they will know which tools to use to achieve the desired result.

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Journalism on the Internet (Интернет-журналистика)

The common forms of media in today's world each has both advantages and disadvantages. The differences between the Internet and Print Journalism are clear immediately upon glancing at either of the two. The Internet takes the best of all other medium and combines them into a very unique form. It is the best way to retrieve information. The internet has several types of journalism which can be defined into three sections. One section is online magazines, online broadcasting, and other online services. The next group is resource files and web pages. The third is discussion groups/forums and e-mail.

An online journal is a service that enables users to access it through the net. This form is much better that conventional publishing, "we are using the online service to enhance the print magazine", for several reasons. It is environmentally safe, "Publish without Paper", most are free. Anyone can get up to the minute news, and reports. "We will send a reporter to the game, who will interview people like the coach and uplink the story while the game is being played." This is an excellent addition to TV. It is a mix of TV and publishing. TV has a schedule to keep and might cut out parts simply for time but there is no time limit online. Also, because it is interactive, users will keep the information in memory longer than if they watched it on TV.

An online service is a web page that sells something. It is easy to order everything, from flowers to even airline tickets. Web pages on the internet are dedicated to enable people to access from any place of the world. Many companies have a web page that offers help to customers, news, services, product updates, advice from experts. By using a search program a user can find files on any topic.

The final area is discussion groups or forums. There is a forum for any topic. A forum is a mail group that allow people all over the world discuss a topic, trade information, etc. "everything from uploaded works by Canadian artists to chats on hockey and politics." Each forum has many users, each with their own point of view. Anyone can talk, bias or not, loving or hating the topic. "There are no rules about what can or cannot go on the Internet. Legal standards are almost impossible to establish and even less likely to be enforced on a global link".

Journalism on the Internet is only one of many things that will be available through the net. As these technologies advance, barriers will be broken, rules set, and the world's knowledge will be a phone call and a mouse click away.

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Newspapers of the 20-s of the XX-th century in Russia: the systemic and socio-cultural factors (Газеты в России 20-х гг XX века: системные и социокультурные факторы)

The 20-s of the XX-th century was the time of radical changes for a young Soviet journalism. This was due to changes in the social composition of society and its information demands. Not all publications of the Soviet press were able to withstand the conditions of the NEP (New Economic Policy). This was evident after the transfer of bodies of periodicals on self-sufficient basis that led to a sharp reduction in the number of periodicals and circulation. Weak technical infrastructure, low level of professionalism led to a decrease in the reader's interest and loss of contact with the audience.

Private periodicals affected the deterioration of the condition of state periodicals press. They successfully competed with the state periodicals press and were designed for business people and entrepreneurs. They attracted readers with their criminal materials and unusual reportage, creating informational competition. This led to a severe crisis in the printing system.

The party decided to strengthen the management of printing. In January 1922, the state approved the network of newspapers in the territory of the RSFSR. Compulsory membership of party members in the party newspapers was introduced. In 1921, the State Institute of Journalism was opened to improve the quality of professional media personnel. Its appearance was to lay the foundations of a new, Soviet press school. Funding for printing starts from the state budget.

A year later, there was a marked improvement in the quality of public periodicals. The number of newspaper and magazine periodicals increased. A lot of there were handwritten wall newspapers appeared in factories. Such publications had a circulation of 2-3 thousand copies and quickly spread throughout the Soviet Union.

In the early 20-s the structure of the system of periodicals has undergone changes with the start of the printing sector. The main task of the media was the implementation of specific economic and political targets set by the central government for the Soviet authorities printing sector. The dependence of the media on the party-state system determined its spiritual mission - to be the so-called "teacher of life."

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МАТЕМАТИЧЕСКИЕ НАУКИ

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The calculation of insurance rates in health insurance (Расчет страховых тарифов в медицинском страховании)

Insurance medicine as a form of population-wide protection is a certain organization health care system based on the method of insurance.

Obligatory part of any kind of insurance activities including health insurance are the actuarial calculations that is a system of mathematical and statistical methods with the help of them the calculation of insurance rates are made. An approach based on the theory of Markov processes is widely used in the actuarial practice. In this approach the pattern of system behavior of many states is used to describe the condition of the insured person's.

The simplest situation has two state of the insured person "alive" and "dead". The transition from one state to another is possible only in one direction.

To describe the condition of the person the scheme is commonly used, which includes three states: "healthy", "sick", "died". The probability of recovery of the main groups of diseases is small, so the transition from a state Sick -> Healthy can be neglected. With the help of Kolmogorov differential equations one can build mathematical models and calculate the probabilities of the states in which the insured person will be at a certain time.

To calculate the intensities of the transition from state to state, you can use the statistics of population, morbidity and mortality on the main rates of death causes.

The constructed models and calculated probabilities are needed to calculate insurance rates.

Insurance payment as the main source of income of the insurer is determined on the basis on the insurance tariff (tariff rate). The tariff rate is the price of the insurance risk and other expenses on insurance deal conducting. The set of tariff rate is called the tariff.

The tariff rate is called the gross rate when the insurance contract is concluded. Net rate expresses the price of insurance risk. At the heart of building of a net-rate the probability of occurrence of the insured event is laid.

Using the formulas for the calculation of gross and net rates, you can calculate the value of the insurance rate.

The obtained results allow us to consider the possibility of predicted insurance rates and the morbidity for the following years. Regression equation is made for it and the significance of its coefficients is verified.

Parameter check-up may show that the regression equation is not suitable for prediction, because the value of the tariff rate is set by insurance companies every year.

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Device Reliability Calculation (Расчет надежности устройства) Introduction

The institute of KNIRTI was developed module which data receiving and transmitting. Operation of the module is carried out under conditions of equipment aerospace aircraft. It is necessary to calculate the reliability of the module and evaluate the implementation of the requirements specification.

Theoretical part

Calculated following reliability indices: performance reliability, durability, performance, storage performance, the average shelf life. The basic principle of the calculation - the prediction method. The values of the probabilities of failure to be considered when assessing their criticality is calculated taking into account the structure of the object, modes of its elements from the available experimental data, or reference to their reliability.

Experimental part

Failure rate = 11.57 * 10-6 1 / h.

MTBF = 86430 hours.

The probability of failure, when stored in a heated room for 7 years will be:

 $P = \exp(-0.031 * 0.000001 * 7 * 8760) = 0.998.$

The failure rate when stored in an unheated room is: 0.032 * 10-6 1 / h.

The probability of failure, when stored in an unheated room for 7 years will be:

 $P = \exp(-0.032 * 0.000001 * 7 * 8760) = 0.998.$

The resource module at a probability of 90% is not less than 53600 hours.

Service life of the module with a probability of 90% is at least 45 years. **Conclusion**

Level for calculated absolute requirements specified in the terms of reference in terms of reliability, are met.

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Modal example of inverse spectral problem (Модальный пример обратной спектральной задачи)

Cluster of functionals is considered in n-dimensional Euclidean space E^n only with using of following conditionals:

- 1. $L(\mu, \varepsilon) = (A_0 + \varepsilon A_1) \mu(B_0 + \varepsilon B_1): E^n \to E^n$ 2. $\max(\operatorname{rem} kL(\mu, 0)) = m < n$
- 2. $\max_{\mu \in C} (rankL(\mu, 0)) = m < n$

We entered concept of quasiregular spectrum functionals $L_0(\mu)$ and we considered its qualities and ways to calculate it.

It was shown that if you need to calculate quasiregular spectrum functionals $L_0(\mu) = A_0 - \mu B_0$ you have to deduce it to variety which is useable for this conditional:

 $C_{0}(\mu)\mu = \begin{pmatrix} C_{11} - \mu I_{1} & C_{12} \\ C_{21} & 0 \end{pmatrix} : E^{n} \to E^{n} \text{ where}$ $C(\mu, \varepsilon) = S_{1}L(\mu, \varepsilon)S_{2} = C_{0}(\mu) + \varepsilon C_{1}$

Then, we should find spectrum of matrix C_{11} which is going to be genuine quasiregular spectrum of functionals.

All theoretical facts were checked with modal example of functionable irregular cluster the fourth dimension. Two modal examples of cluster were built and a number of its perturbation was checked.

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The regularized trace of the Sturm – Liouville operator with slowly growing potential (Регуляризованный след оператора Штурма – Лиувилля с медленно растущим потенциалом)

For a singular Sturm – Liouville operator with slowly increasing potential an asymptotic equation for the spectrum is:

$$\int_{0}^{a_{\lambda_{k}}} \sqrt{\lambda_{k} - q} dt = \pi \left(k + k_{0} - \frac{1}{4} \right) + O\left(\lambda_{k}^{\frac{3}{2}}\right),$$

where k_0 is a positive integer. Using this equation, written the first few (up to summing residue) asymptotic series for the eigenvalues of the members at $q = \ln(x + a)$, a > 0:

$$\begin{split} \lambda_k &= \ln \Big(2 \sqrt{\pi} \, k \Big) + k^{-1} \Big(\frac{1}{\pi} (\ln k)^{\frac{1}{2}} - \frac{1}{4} + C_0 (\ln k)^{-\frac{1}{2}} \Big) \\ &+ O \left(k^{-1} (\ln k)^{-\frac{3}{2}} \right), \ k \to \infty, \end{split}$$

where $C_0 = \frac{1}{2\pi} (1 + \ln(2\sqrt{\pi}))$, and found regularized trace σ :

$$\sigma = \frac{1}{4} \left(\ln(2\sqrt{\pi}) + \gamma \right)$$
$$- \frac{1}{2} \ln(2\pi) - \frac{1}{\pi} \int_{1}^{\infty} \{x\} \left((\ln x)^{\frac{1}{2}x^{-1}} \right)^{'} dx$$
$$- \frac{1}{2\pi} \left(1 + \ln(2\sqrt{\pi}) \right) \int_{1}^{\infty} \{x\} \left((\ln x)^{-\frac{1}{2}x^{-1}} \right)^{'} dx,$$

where γ – the Euler constant.

This shows that the main difficulty in the theory of traces associated with the rapid (in this case – exponential) growth of $N(\lambda)$ can be overcome, if we know the asymptotic behavior of the spectrum. Earlier (see [1]) even in the presence of the asymptotic behavior it should be studied only in the case where $N(\lambda) = O(\lambda^{\alpha})$.

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Equations différentielles et Cinétique chimique (Дифференциальные уравнения и химическая кинетика)

En Cinétique, l'étude des vitesses lors des réactions conduit à des équations différentielles dont la plupart correspondent au programme de Mathématiques des classes de S.T.S chimistes. Les sujets traités en Chimie générale permettent ainsi d'illustrer le cours de Mathématiques et de montrer l'utilité d'une bonne maîtrise des outils mathématiques. Cependant, les mêmes exercices sont souvent résolues de manière différente dans les deux disciplines. S'il est naturel que chaque professeur mette en évidence ce qui est utile à sa matière, il est préférable que les techniques de résolution ne soient pas trop différentes et qu'elles utilisent des outils correspondant aux programmes de Mathématiques actuellement enseignés dans le secondaire. Après avoir rappelé le cadre théorique, ce document donne des exemples d'équations différentielles rencontrées en Cinétique, principalement à l'attention des étudiants et des nouveaux collègues de Mathématiques. Les collègues de Chimie qui connaissent parfaitement le sujet, trouveront peut-être utile de voir comment on peut rédiger les calculs en tenant compte de l'évolution des programmes de Mathématiques. En particulier pour les "équations à variables séparables".

Le théorème fondamental: la solution générale d'une équation différentielle linéaire est la somme de la solution générale de son équation sans second membre et d'une solution particulière de cette équation.

L'établissement d'une équation différentielle résulte de l'application de lois à un système chimique. Celui-ci est simplifié et

modélisé, les lois sont appliquées de façon approchée. La forme de la solution exacte est obtenue par détermination des constantes d'intégration par la prise en compte des conditions initiales (par exemple, valeur des variables à t = 0), elles-mêmes connues avec des incertitudes. Bref, les approximations existent à tous les niveaux. L'équation différentielle ne dépend pas en général des conditions (initiales). Toutefois, les solutions peuvent être très différentes selon les valeurs de départ.

Une réaction chimique maintenue à température constante admet un ordre si sa vitesse volumique s'exprime à l'aide d'une fonction monôme des concentrations des réactifs. On peut alors déterminer la concentration à tout instant d'un réactif ou d'un produit en résolvant l'une des équations différentielles précédentes et en tenant compte de la concentration initiale de ce corps. Contrairement aux équations linéaires, il n'y a pas de méthode générale pour résoudre ou "intégrer" l'équation. C'est ici que l'on va rencontrer les plus grandes difficultés si on s'écarte des concepts étudiés et qu'on utilise un formalisme ou des savoir-faire qui ne sont plus d'actualité.

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Today's text recognition (Распознавание текста сегодня)

In today's world the amount of transmitted information is huge. The big part of the documents transmitted electronically. With all the obvious advantages of this method of transmission modern workflow has not stopped storing data on paper. This is due to the data security. This approach creates a problem of transmission of documents that exists only on paper. Of course, they can be scanned and sent as a JPG, PNG files, but this kind of storage is difficult processing required systematization of the received documents. There is also a problem of translation in the text of the image. But the volume of workflow makes this process impossible for manual execution. The text-recognition software came to us to aid, or more accurately OCR, for example such as:

1. Recognita Plus DTK firmy Recognita Corporation (Hungary)

2. TextBridge company Xerox Imaging Systems,

3. Type Reader firm ExperVision (USA)

4. SharacterEyes firm Ligature (Israel)

5. IRIS OCR company I.R.I.S. (Belgium)

The most famous in Russia are OCR CuneiForm and ABBYY FineReader. But they are not universal. Each program has a number of drawbacks.

The task of text recognition, even with such an abundance of implemented programs, has not been solved completely. Strong distortions of the text, such as: blur, merging with the background, extraneous dots or lines dramatically reduces the quality of recognition, but people will read the text easily.

Unfortunately, at present there is no general algorithm that would allow solving the problem of text recognition. All developed algorithms have different internal structure and recognition principles. But now there are sub-tasks recognized partition OCR, namely: pre-processing image noise filtering, segmentation - selection of images of characters from the image text, recognition - characters feature extraction and comparison of these characteristics with the stored samples. Each sub problem contains many solutions options, of which only some are more or less optimal. However, this approach allows us to consider the problem of text recognition in more detail, and most importantly, splits it into virtually non-overlapping tasks. Each sub-task delivers only the input for the next stage.

Taking the above into account, we can conclude that the problem of recognition of the text is very relevant and has not yet been solved.

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Artificial neural network in pattern recognition (Искусственная нейронная сеть в распознавании образов)

Neural network is a learning system. It works not only in accordance with specified algorithm and formulas, but also based on past experience. Artificial neural network is mathematics model inspired by biological neural network (central nervous system, in particular brain). The basis of the neural network is a neuron - an element that simulates the brain neurons. An artificial neuron is a mathematical function conceived as a model of biological neurons. The artificial neuron receives one or more inputs and sums them to produce an output. Usually the sums of each node are weighted, and the sum is passed through a nonlinear function known as an activation function.

In terms of machine learning, neural network is a special case of pattern recognition methods, discriminant analysis, clustering methods, and so on. Pattern recognition is a branch of machine learning that focuses on the recognition of patterns and regularities in data. By pattern can be mean different in their nature objects like text symbols, pictures, sound samples etc. When neural network is created it is blank sheet, clean and empty, it needs to be learned.

There are several architectures of the network which can be used in pattern recognition. It is divided on "Supervised learning" and "Unsupervised learning". Supervised learning is one of the methods of machine learning, during which the system under test force is trained using examples of "stimulus-response". In supervised learning can be excrete Perceptron and Adaptive resonance theory. In machine learning, the perceptron is an algorithm for supervised learning of binary classifiers: functions that can decide whether an input (represented by a vector of numbers) belongs to one class or another. System gets samples and shows its conclusion, if it is wrong supervisor inform system and vice versa. With some number of samples later system will give us the exact answer. In process of learning to network offers different samples of pattern with designation to which class it is belongs. This sample usually is a vector of values of attributes. Samples can be "clean", which means it is perfectly matches values of attributes. In this case set of all attributes must uniquely identify the class in which sample is belongs. In other case network can identify sample to several classes, which is wrong. Or there can be "noise", which means that sample has a bad quality. At first we must use "clean" samples for learning, and then we should use "clean" and "noise" samples together. It is increases network results. When network finishes its learning we can produce it indefinite sample and know which class it belongs.

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Parallel Programming (Параллельное Программирование)

Many personal computers and workstations have two or four cores (that is, CPUs) that enable multiple threads to be executed simultaneously. Computers in the near future are expected to have significantly more cores. To take advantage of the hardware of today and tomorrow, you can parallelize your code to distribute work across multiple processors.

Parallel computing is a type of computation in which many calculations are carried out simultaneously, operating on the principle that large problems can often be divided into smaller ones, which are then solved at the same time. There are several different forms of parallel computing: bit-level, instruction-level, data, and task parallelism. Parallelism has been employed for many years, mainly in high-performance computing, but interest in it has grown lately due to the physical constraints preventing frequency scaling. As power consumption (and consequently heat generation) by computers has become a concern in recent years, parallel computing has become the dominant paradigm in computer architecture, mainly in the form of multi-core processors.

In the past, parallelization required low-level manipulation of threads and locks. Visual Studio 2010 and the .NET Framework 4 enhance support for parallel programming by providing a new runtime, new class library types, and new diagnostic tools. These features simplify parallel development so that you can write efficient, fine-grained, and scalable parallel code in a natural idiom without having to work directly with threads or the thread pool.

I find this topic to date, because there are quite a large number of long, complex tasks that are used to process large amounts of data. Via serial computation solving these problems requires a lot of time and effort, and if we use parallel algorithms, everything will be much faster and easier to work with.

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Recognition techniques in ornithology (Методы распознавания в орнитологии)

Nowadays the problem of pattern recognition is pending. With the development of computer engineering this task has become real. Pattern recognition is currently applied in many spheres. The aim of pattern recognition is non-trivial. Mathematical modeling tasks apply the following algorithm: mathematical model, solution algorithm, calculation. It is not always an easy task to develop a mathematical model, sometimes this problem is even insolvable. But some problem-solving techniques are based on another core notion. The development of mathematical model is often not required. It is enough to compile only main fragments. Thus we reduce the amount of calculations, economize time and resources. It leads to the task of recognition of a separate pattern.

It's especially interesting to apply pattern recognition technique in ornithology. Statement of a problem is quite simple: we need to find coordinates of a contour line of a bird's quill and coordinates of a contour line of a bird's quill in the picture. The aim of the program is to identify a bird by its feather.

Thus, we have a colour image. The colour image needs to be converted into the image with the shades of a grey colour. Then we need to perform an operation of building-up a half-tone picture. Building-up an image simplifies detection of graphic elements.

The next main stage is thresholding. We obtain a binary image by using clipping by luminance threshold. Luminance threshold index equals to 0.3.

The core phase of contour line of feather recognition is the detection of the contour line of an object in the binary image. This action is performed with the help of a special function. This function returns two-dimensional array. This array stores values of coordinates of all the points of the contour line of a feather.

Then contour line of a quill is being determined. We again have a colour image. We need to convert a colour image into the one of a grey colour one more time. Then we should use median filtering. After median filtering the image stretches out horizontally. That's why we can single out horizontal lines. Then we need to convert the image into the binary image. In the image we will see mostly horizontal lines.

Then we need to apply image filtration with the help of morphological filter. Then we should build up the image.

Bird's quill is obviously the longest object. Special function deletes all the objects that are shorter than the maximum length.

Further actions include acquisition of values of coordinates of border pixels of the member objects with the help of Lagrange interpolating polynomial.

With the help of Lagrange interpolating polynomial we will be able to obtain coordinates of the border. The assigned task may be considered accomplished.

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Logique mathématique (Математическая логика)

La logique mathématique (de logique théorique, logique symbolique) est une branche des mathématiques qui étudie la notation mathématique, systèmes formels qui sont le raisonnement mathématique prouvable, la nature de la preuve mathématique en général, la calculabilité, et d'autres aspects des fondements des mathématiques. Plus largement considéré comme mathématiser branche de la logique formelle – la «logique du sujet, la méthode de calcul", "logique, développé avec l'aide de méthodes mathématiques".

La mise en place de la logique symbolique comme langue scientifique universelle considérée Leibnitz en 1666 dans «L'art de la combinatoire» (De arte combinatoria). Au milieu du XIX siècle, il est apparu la première logique aristotélicienne travail algébrisation, formé le principe fondamental du calcul propositionnel (Boole, De Morgan, Schroeder). Dans les œuvres de Frege et Peirce (fin 1870 - début 1880) introduit la logique de variables individuelles, quantificateurs, et donc fondé le calcul des prédicats. À la fin de 1880, Dedekind et Peano utilisés ces outils dans une tentative d'axiomatisation de l'arithmétique, avec Peano a créé un système commode de notation, et un pied dans la logique mathématique moderne.

Whitehead et Russell créés en 1910-1913 traité Principia Mathematica, qui a eu un impact exceptionnel sur le développement ultérieur de la logique mathématique. Un autre jalon important dans le développement de la logique était la découverte inhérent au niveau de développement du calcul logique et théorie des ensembles, la fin du XIX siècle de paradoxes, dans le dépassement de ce qui introduit le concept de l'intuitionnisme et la logique intuitionniste (Brower, 1908) et, à titre subsidiaire, Gilbert a créé le programme des fondements des mathématiques par la formalisation axiomatique avec des ressources très limitées, ne pas conduire à des contradictions.

Application de la logique des méthodes mathématiques devient possible lorsque les jugements formulés dans un langage précis. Un tel langage précis ont deux faces: la syntaxe et la sémantique. La syntaxe
est l'ensemble des règles de construction des objets de la langue (généralement appelé formules). La sémantique est l'ensemble des accords qui décrivent notre compréhension des formules (ou certains d'entre eux) et permet de considérer la formule est vrai, et l'autre - pas.

Un rôle important dans la logique mathématique joue une théorie et les concepts de calcul déductif. Calcul est l'ensemble des règles d'inférence qui permettent de tenir compte de certaines formules peuvent dériver. Les règles d'inférence sont divisés en deux classes. Certains d'entre eux sont directement qualifier certaines formules comme sortie. Ces règles d'inférence sont appelés axiomes. D'autres suggèrent dériver formule A est syntaxiquement liée à une certaine façon de pré-définie avec un ensemble fini de sortie A_1, \dots, A_n formules. Une règle largement utilisé du second type est généralement de **modus ponens**: Si le message de Formule A et $A \rightarrow B$, Formule B et est déductible.

Dans la pratique, un ensemble d'opérations logiques élémentaires est une partie essentielle de l'ensemble des microprocesseurs modernes d'instruction et, en conséquence, inclus dans les langages de programmation. Il est l'une des applications pratiques les plus importants de méthodes de la logique mathématique, a étudié l'informatique dans les manuels modernes.

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Die Differentialoperatoren (Дифференциальные операторы)

Der verallgemeinerte Fock-Raum wird auf folgende Weise definiert:

$$F_{\beta} = \left\{ f(z) \in H(\mathbb{C}) \colon \|f\|^2 = \frac{1}{\pi_{\overline{\beta}}^2 \Gamma\left(\frac{2}{\beta}\right)} \int_{\mathbb{C}} |f(z)|^2 e^{-|z|^{\beta}} d\mu < \infty \right\},$$

$$\beta > 0,$$

wobei $d\mu$ — Lebesgue–Maß auf der Ebene ist. Der Fock–Raum F_{β} ist Hilbert Raum.

Der Operator der Multiplikation auf Variable Z sieht S = z. aus. Der Operator der verallgemeinerten Differenzierung ist $Df(z) = D \sum_{n=0}^{\infty} a_n z^n = \frac{1}{z} \sum_{n=0}^{\infty} a_n m_n z^n$, wo $f(z) = \sum_{n=0}^{\infty} a_n z^n$, $m_n = \frac{\Gamma(\frac{2}{\beta}(n+1))}{\Gamma(\frac{2n}{\beta})}$, $n \ge 1$, $m_0 = 0$.

Der klassische differentiale Operator wird wie der Ausdruck $S^* = c_1 \frac{d}{dz} + c_2 z \frac{d^2}{dz^2} + \dots + c_{n-1} z^{n-2} \frac{d^{n-1}}{dz^{n-1}} + c_n z^{n-1} \frac{d^n}{dz^n} + \dots$ definiert, wobei $n < \infty$ oder $n = \infty$ nach dem Raum ist.

Theorem 1. Der verknüpfte Operator zum Operator der Multiplikation $S = z \cdot ist$ ein Operator der Differenzierung $S^* = c_1 \frac{d}{dz} + c_2 z \frac{d^2}{dz^2} + \dots + c_{n-1} z^{n-2} \frac{d^{n-1}}{dz^{n-1}} + c_n z^{n-1} \frac{d^n}{dz^n} + \dots$

Der klassische differentiale Operator S^* stimmt mit dem Operator der verallgemeinerten Differenzierung D überein. Es sei $k = \frac{2}{\beta}$, dann falls k — die ganze Zahl ist, so ist der differentiale Operator S^* endlich mit Ordnung k, falls k — die unganze Zahl ist, so ist der differentiale Operator S^* unendlich.

Theorem 2. Die Koeffizienten dieses Operators

$$S^* = c_1 \frac{d}{dz} + c_2 z \frac{d^2}{dz^2} + \dots + c_{n-1} z^{n-2} \frac{d^{n-1}}{dz^{n-1}} + c_n z^{n-1} \frac{d^n}{dz^n} + \dots$$
werden

$$c_n = \frac{\Gamma(k(n+1))}{n!\Gamma(kn)} - \frac{c_1 n + c_2 n(n-1) + \dots + c_{n-1} n(n-1) \cdot \dots \cdot 2}{n!}, n = \overline{(1; n_0)},$$

ausgerechnet, wobei n_0 — die Ordnung des differentialen Operators ist.

Da der Differentialoperator S^* auf die ganze Funktion einwirkt, aber die Koeffizienten $c_n, n = \overline{(1;n_0)}$, sind solche, dass erfüllt die Bewertung $\overline{\lim_{n \to \infty} \sqrt[n]{|c_n|}} < \infty$, so wird auch eine ganze Funktion erhalten. Das heißt, aus der Ausführung der Bedingungen $\overline{\lim_{n \to \infty} \sqrt[n]{|a_n|}} = 0$ und $\overline{\lim_{n \to \infty} \sqrt[n]{|c_n|}} < \infty$ erfolgt die Gleichheit $\overline{\lim_{n \to \infty} \sqrt[n]{|a_n c_n|}} = 0$. 398 Für die Koeffizienten $c_n, n = \overline{(1; n_0)}$, wird die asymptotische Einschätzung $c_n \leq \frac{k^k n^{k-n+\frac{1}{2}} e^n (1+\frac{1}{n})^{k-\frac{1}{2}}}{\sqrt{2\pi}}$ erfüllt und die Gleichheit gilt als $\overline{\lim_{n \to \infty} \sqrt[n]{|c_n|}} = 0$.

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How long until the first machine reaches superintelligence? (Сколько времени осталось до того, пока первая машина не достигнет суперинтеллекта?)

Not shockingly, opinions vary wildly and this is a heated debate among scientists and thinkers. Many, like professor Vernor Vinge, scientist Ben Goertzel, Sun Microsystems co-founder Bill Joy, inventor and futurist Ray Kurzweil, Jeremy Howard subscribe to the belief that this is happening soon - that exponential growth is at work and machine learning, though only slowly creeping up on us now, will blow right past us within the next few decades.

Others, like Microsoft co-founder Paul Allen, research psychologist Gary Marcus, NYU computer scientist Ernest Davis, and tech entrepreneur Mitch Kapor, believe that thinkers like Kurzweil are vastly underestimating the magnitude of the challenge and believe that we're not actually that close to the tripwire.

The Kurzweil camp would counter that the only underestimating that's happening is the under appreciation of exponential growth, and they'd compare the doubters to those who looked at the slow-growing seedling of the internet in 1985 and argued that there was no way it would amount to anything impactful in the near future.

A third camp, which includes Nick Bostrom, believes neither group has any ground to feel certain about the timeline and acknowledges both A) that this could absolutely happen in the near future and B) that there's no guarantee about that; it could also take a much longer time.

In 2013, Vincent C. Müller and Nick Bostrom conducted a survey that asked hundreds of AI experts at a series of conferences the following question: "For the purposes of this question, assume that human scientific activity continues without major negative disruption. By what year would you see a probability for such HLMI4 to exist?" It asked them to name an optimistic year, a realistic guess, and a safe guess. Gathered together as one data set, here were the results: 1) Median optimistic year (10% likelihood): 2022, 2) Median realistic year (50% likelihood): 2040, 3) Median pessimistic year (90% likelihood): 2075 © Саханевич Михаил, 2016

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Théorie du potentiel (Теория потенциала)

La théorie du potentiel est une branche des mathématiques qui s'est développée à partir de la notion physique de potentiel newtonien introduite par Poisson pour les besoins de la mécanique newtonienne.

Fonctions harmoniques. Elle concerne l'étude de l'opérateur laplacien et notamment des fonctions harmoniques et sous-harmoniques. Dans le plan complexe par exemple, cette théorie commence par l'étude de la fonction potentiel et de son énergie.

Le potentiel est un exemple simple de fonction sous harmonique. Un théorème de représentation de Riesz nous dit que sous certaines conditions très simples, les fonctions sous harmoniques sont les fonctions potentielles, modulo l'ensemble des fonctions harmoniques. Cette remarque donne donc tout son intérêt à l'étude des fonctions potentielles.

Capacité. La capacité est une fonction agissant sur les ensembles. Elle est à la théorie du potentiel, ce que la mesure est à la théorie de la mesure. Elle permet en quelque sorte de mesurer la taille d'un ensemble, au sens de la théorie du potentiel. Elle apparaît naturellement dans plusieurs domaines des mathématiques, notamment en théorie de l'approximation ou en analyse complexe.

On peut modifier légèrement la définition du potentiel, en remplaçant la distance euclidienne par la pseudo-distance hyperbolique, dans le cas où E est un sous ensemble du disque unité, ou par la distance sphérique, dans le cas où E est un sous ensemble de la sphère de Riemann. Cela fournira alors de nouvelles capacités, respectivement la capacité hyperbolique et la capacité sphérique ou elliptique de E.

Un ensemble E est dit polaire s'il est de capacité nulle. On peut montrer qu'un sous ensemble du disque unité est polaire si et seulement s'il est polaire relativement aux capacités hyperbolique et elliptique.

Un ensemble polaire est nécessairement de mesure de Lebesgue nulle. Les ensembles polaires et F_{σ} sont totalement discontinus. On peut voir que la réciproque à ces deux assertions est fausse. L'ensemble triadique de Cantor est totalement discontinu et de mesure nulle, mais n'est pas de capacité nulle.

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Mathematical model of price and demand change in the form of the system of two linear differential equations (Математическая модель изменения цены и спроса в виде системы двух линейных дифференциальных уравнений)

In this article, we propose a mathematical model of the dynamics of changes in price and demand, which is based on a system of two linear differential equations.

We introduce the notation:

x - demand, x' - demand's speed; y - price, y' - price's speed

We assume that the demand's rate is linearly dependent on the price of y; the higher price of y, the lower the rate of demand. Obviously, the demand will be greatest when y is close to zero; If y = 0, then the

demand increases according to the formula x' = ax, a > 0 (a - demand growth rate).

Also we assume that the price's rate is linearly dependent on the demand of x; the greater the demand of x, the lower the speed of rates. Obviously, the highest price of y will be when x = 0; if x = 0, then the price will fall according the law y' = -cy, c > 0 (c -price growth rate)

The lower the price, the higher the rate of demand for the product. If ax = 0, then x' = -by. As a result, we get the formula: x' = ax - by, a > 0, c > 0.

On the other hand, the profit received from the sale, stimulates an increase of theprices. The greater the demand, the greater the speed of the price.

If -cy = 0 then y' = dx. Those., we have y' = -cy + dx, c > 0, d > 0, where $x \ge 0$; $y \ge 0$.

So, we have a system of model equations "price - demand".

$$x' = ax - by, a > 0, b > 0$$

 $y' = -cy + dx, c > 0 d > 0.$

If this system we get rid of the variable x, then for the variable y, we obtain the differential equation of 2nd order: y'' + (a-c)y' + (ac-bd)y = 0

Depending on the values of the coefficients we get three different solutions, which are different with qualitative behavior: 1) If a = c, then the solution is a periodic function; 2) If a < c, then we obtain a decaying function; 3) If a > c, then we obtain a periodic swinging. In this case, the demand is changing at a rapid rate, the price has no time to react.

Similarly, we obtain the same equation for x:

$$x'' + (a - c)x' + (ac - bd)x = 0$$

There are also three similar cases of the solution

If the demand or the price is derived from the state of equilibrium, in the case of 1) occur periodic fluctuations in demand and prices, which are returned to their initial state. After some time again and again. Fluctuations in demand and price have the same period but different amplitude. When demand is at its maximum, the value at this time is minimal. The price and demand vary in antiphase.

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Informational and analytical system developed for trouble prediction and drilling optimization (Информационно-аналитическая система для предсказания осложнений и оптимизации бурения)

Selection of the right mode of drilling oil and gas wells and prevention of possible troubles are necessary for improving the efficiency and safety of drilling while designing and constructing oil and gas wells. Projects on the construction of wells are often based on scattered data that is not effective in present conditions. Automated analysis of data on previously drilled wells allows increasing efficiency of drilling optimization and prediction of troubles. The authors of the present paper have developed the database on drilling parameters containing information about the drilled wells, the drilling modes and troubles arising while drilling.

The database developed includes the following sections:

1) well registry;

2) production data on well drilling;

3) production data on troubles;

4) production data on bits and down hole motors;

5) reference data for calculations;

6) results of calculations.

The developed database allows storing and processing data on existing wells, adding data on wells being entered into exploitation and uploading tabular and graphic information on users' requests.

While the main deal of the database is the core of informational and analytical system for trouble prediction and selection of the best modes for drilling new wells.

Currently, in addition to the database, the system includes modules for statistical analysis of production data on drilling modes and troubles based on artificial neural networks and nonparametric regression methods. At present the authors are working over improvement of the algorithms taking into account the physical and mechanical properties of the rocks drilled.

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Electronic education (Электронное образование)

One of the broadest concepts in modern education is 'electronic education'. A few years ago this notion was associated with distant education, which means education in distance by using information technologies. Although, now this idea includes something more.

Now, electronic education is an implantation of different gadgets such as laptops, tablets in an educational fields, it is using electronic books while studying, it is an exchange of assignments by information technologies. Filling the journal has become exclusively electronic. The diary has also become electronic. Each parent has an access to enter distantly from a home computer to a necessary website and see his child's progress.

For the time being, not all Russian schools can afford themselves join full electronic education. Problems can be caused by either a budget of an educational institution or an inability of parents to afford themselves a necessary device. Or even an inability to provide the internet to educational institutions. Although, this problem appears rarely and has almost disappeared.

As it is known, from the 1st January 2015 only those books will be issued that have an electronic version. It is demanded by a new educational law. The implantation of the electronic books in an educational field makes studying process easier. Firstly, students' bags have become lighter which erases students' physical health problem. Secondly, an educational process is becoming more interactive which positively affects lessons.

According to statistics of 2015 the tendency of using electronic nooks in Russia is no more than 40%. However, in 2016 the tendency has increased to 70% and later all Russian schools will have to use electronic books.

The question of current interest is: 'Will the teacher's job, as we know it now, disappear in connection with the full informatization and the impetuous development of information technologies?'

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Georg Cantor (Георгий Кантор)

G. Cantor studierte und wirkte als Hochschullehrer in einer Zeit, in der sich viele Mathematiker bemühten, nach der stürmischen Entwicklung ihrer Wissenschaft im 17. und 18 Jahrhundert die Grundlagen der neu eroberten mathematischen Disziplinen zu festigen.

In fast 25 Jahren intensiver Arbeit, die auch noch durch eine schwere Krankheit unterbrochen wurde, erschienen in "Greiles Journal für Mathematik", den Göttinger Nachrichten und in den Mathematischen Annalen neun wissenschaftliche Abhandlungen, die in ihrer Gesamtheit die Cantorsche Mengenlehre ergaben.

Durch die Zahlenbereichserweiterungen war auch die Anzahl unendlicher Mengen von Zahlen größer geworden. Georg Cantor stelte jetzt Vergleiche zwischen verschiedenen unendlichen Mengen an. Er führte die Eigenschaft abzählbar unendlich ein für solche unendliche Mengen, die der Menge der natürlichen Zahlen äquivalent sind.

Er bezeichnete ihre Mächtigkeit als die kleinste transfinite Kardinalzahl

"Aleph -Null".

Die Erkenntnis und der Beweis, daß die Menge aller rationalen Zahlen abzählbar unendlich ist, war die erste revolutionierende Entdeckung Cantors.

Die im Endlichen gültige Wahrheit, daß das Ganze größer ist als jedes seiner Teile, hat im Unendlichen offenbar keine Gültigkeit mehr. Die berechtigte Frage, ob alle unendlichen Mengen abzählbar sind, beantwortete Cantor durch die Untersuchung der Menge der reellen Zahlen zunächst im Interval (0,1). Ausgehend von einer beliebig unendlichen Folge reeller Zahlen, dargestellt durch eine nicht abbrechende Dezimalzahl, deren ganzzahliger Anteil Null ist, konnte er durch das 2. Diagonalverfahren mindestens eine reelle Zahl konstruieren, die nicht dieser unendlichen Folge angehörte.

Georg Cantor verallgemeinerte diese Erkenntnis auf ein beliebiges Intervall (a,b), das aus (0,1) durch eine Streckung im Verhältnis (ba) entsteht. Er festigte sie durch eine Reihe von Untersuchungen von Punktmengen in den verschiedensten Räumen. Damit hatte er nachgewiesen, daß die Menge aller reellen Zahlen nicht - oder überabzählbar ist.

Das war Cantors zweite revolutionierende Entdeckung.

Damit hatte er den Sprung ins Unendliche getan und zwei unterschiedliche "Unendlichkeiten" nachgewiesen:1. Die abzählbare Unendlichkeit der Menge der natürlichen äquivalenten Mengen und 2. die nicht abzählbare Unendlichkeit des Kontinuums.

In den weiteren Arbeiten wies Cantor ferner nach, daß es nicht nur diese beiden transfiniten Kardinalzahlen gibt, sondern daß beliebig viele Kardinalzahlen existieren. weil keine größte Kardinalzahl nachweisbar ist. Das von Cantor damit ausgelöste Konntinuumproblem hat erst in jüngster Zeit eine unerwartete Lösung gefunden.

Doch die Bedeutung der Mengenlehre war groß und vielseitig. Sie hat nicht nur viele Gebiete der Mathematik und ihre philosophischlogischen Grundlagen befruchtet sondern erwies sich auch als außerordentlich verallgemeinerungsfähig. Auf ihren Grundlagen wurden ganz neue mathematische Teilgebiete geschaffen, wie die Theorie der Punktmengen, Theorie der reellen Funktionen, die Topologie, die Funktionalanalysis, die moderne Algebra, die Maßtheorie u.a.

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What is the future of the book? It is much brighter than people think.

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Numerical investigation of thermo viscous fluid flow in divergent channels (Численное исследование течения термовязкой жидкости в расширяющихся каналах)

A lot of variants of solutions of the heat problem are used in industrial processes. Heat exchanging units transfer heat or cold from one fluid to another and it play a key role in ensuring the efficiency of the entire production process. Heat- exchange equipment is used in more than 60% of various branches of Russian production. In practice, the most commonly used are smooth pipe heat exchangers, which are operated for more than 50 years and are morally and physically obsolete.

This problem is observed in key industries such as food processing, petrochemical, chemical, and medical, in the housing sector. So, this raises the question about how to update and upgrade the outdated heat transfer equipment with the least financial and energy costs. Heat-exchange units in sort of diffuser-confuser are the most effective ones. The first practical applications of these units in the form of a slot-ted channel were suggested in the 20-ies of the last century by two scientists – Koch and Nunnen. This work was carried out numerical investigation of the flow of thermo viscous fluid in the heat- exchanger unit diffuser – konfuzer.

The attempt of numerical solution of this problem is made in this work. Two dimensional mathematical model is written in polar coordinates and is solved by using the method of controlled volumes. The results obtained using this model full enough describes the dependence of the flow rate and flow velocity of fluid, the heat allocation in dependence on the angle between the channel walls, the Reynolds number, the Prandtl number, the pressure in the channel. These results are useful for improving the work of the confuser-diffuser heat exchange units.

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Zur Klasse von hyperbolischen Gleichungen mit Integralen zweiten Grades (Об одном классе гиперболических уравнений с интегралами второго порядка)

Die grundlegenden Ideenbei der Forschung der Integration von partiellen Differentialgleichungen des hyperbolischen Typsentstammen den klassischen Werken von Laplace, Darboux, Goursat, Vessiot und anderen. Dabei wurde die Auffassung der Integrierung als einer expliziten Formel zur allgemeinen Lösung fast sofort durch andere weniger belastende Definitionen verdrängt. Zum Beispiel das Darboux Verfahren der Integrierungder hyperbolischen Gleichung besteht in der Suche nach Integralen in jeder charakteristischen Richtung und seine weiteren Zusammenführung zu zwei Differentialgleichungen.

In diesem Beitrag werden die Gleichungen der Art

$$u_{xy} = \frac{p - \overline{\varphi}_u}{\overline{\varphi}_{u_y}} u_x + \frac{q}{\overline{\varphi}_{u_y}} \sqrt{u_x}$$
(1)

betrachtet. Hier sind p,q - Funktionen von Variablen x, y, u, und $\overline{\varphi}$ - von Variablen x, y, u, u_y .

Eswerden auch die Bedingungen angeführt, unter denen Gleichungen der Art (1) die Integrale zweiten Grades besitzten.

Zur vollständigen Einteilung der nach Darboux integrierten Gleichungen gemäß dem Artikel [1] ist es notwendig die Klassifizierung von Gleichungen der Art (1) durchzuführen, die dieIntegrale zweiten Grades besitzen.

Weiterhin werden hier Gleichungen (1) beschrieben, die die Integrale zweitenGrades enthalten.

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Nvidia's CUDA: The End of the CPU? (CUDA от Nvidia: конец CPU?)

CUDA is a parallel computing platform and application programming interface (API) model created by NVIDIA. It allows software developers to use a CUDA-enabled graphics processing unit (GPU) for general purpose processing – an approach known as GPGPU. The CUDA platform is a software layer that gives direct access to the GPU's virtual instruction set and parallel computational elements.

The evolution of the modern graphics processor begins with the introduction of the first 3D add-in cards in 1995, followed by the wide-spread adoption of the 32-bit operating systems and the affordable personal computer. The first GPUs were designed as graphics accelerators, supporting only specific fixed-function pipelines. Starting in the late 1990s, the hardware became increasingly programmable, culminating in NVIDIA's first GPU in 1999. Less than a year after NVIDIA coined the term GPU, artists and game developers weren't the only ones doing ground-breaking work with the technology. But GPGPU was far from easy back then, even for those who knew graphics programming languages such as OpenGL. GPGPU was practically off-limits to those who hadn't worked with the latest graphics APIs until a group of Stanford University researchers set out to reimagine the GPU as a "streaming processor."

In 2003, a team of researchers led by Ian Buck unveiled Brook, the first widely adopted programming model to extend C with dataparallel constructs. Using concepts such as streams, kernels and reduction operators, the Brook compiler and runtime system exposed the GPU as a general-purpose processor in a high-level language. Most importantly, Brook programs were not only easier to write than handtuned GPU code, they were seven times faster than similar existing code.

NVIDIA knew that blazingly fast hardware had to be coupled with intuitive software and hardware tools, and invited Ian Buck to join the company and start evolving a solution to seamlessly run C on the GPU. Putting the software and hardware together, NVIDIA unveiled CUDA in 2006, the world's first solution for general-computing on GPUs.

In conclusion, the practice of using these general-purpose graphical processing units (GPGPUs) for HPC workloads is now common. The CUDA framework is utilized on NVIDIA GPUs and the OpenCL framework is utilized on both AMD GPUs and NVIDIA GPUs. While other accelerator technologies are emerging, GPUs are currently the most widely-adopted accelerator technology in high-performance computing.

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МЕДИЦИНА И ПСИХОЛОГИЯ

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The urgency of study of the genetic risk factors of autism (Актуальность изучения генетических факторов риска развития аутизма)

The autism spectrum disorders (ASDs) are a complex group of neuropsychiatric conditions involving language, social communication, and mental flexibility (Brett S. Abrahams, PhD and Daniel H. Geschwind, MD, PhD, 2010). Autistic disorder is the most severe part of a group of neurodevelopmental disorders referred to autism spectrum disorders (ASDs), which share the common feature of disfunctional reciprocal social interaction (Brett S. Abrahams and Daniel H. Geschwind., 2008).

Autism is one of the most common childhood psychiatric disorders, which are socially significant medical problems (Zelenova et ai., 2013). A meta-analysis of ASD prevalence rates suggests that approximately 37 in 10,000 individuals are affected (Fombonne E., 2005). The urgency of the problems caused by disability of most patients, lifelong therapy, social assistance result in financial costs for society (Mandell, Knapp, 2012). In the Russian Federation Statistics of patients with autism spectrum disorders is not conducted. Therefore, most likely, many groups of the child population are not enough investigated. It is obvious that the development of methods and systems for the examination of children with autism, these figures will increase.

However, despite the great social significance of autism, its etiology is still poorly understood. The prevailing view of polyetiology of the disease, based on the identification of a large number of genes involved in the development of pathologies (Johnson et ai., 2013; Rothenberger, 2012).

A chronological overview of research in the ASDs underscores the short history of genetic work in this area as well as the diversity of the methods are used. Before the 1970s, autism was not widely appreciated to have a strong biological basis. Instead of various psychodynamic interpretations, including the role of a cold or aloof style of mothering, were invoked as potential causes. The importance of genetic contributions became clear in the 1980s, when the co-occurrence of chromosomal disorders and rare syndromes with the ASDs were noted (Blomquist HK, et al., 1985).

According to the latest research of the American College of Medical Genetics and according to electronic resource «Autism Genetics» 40% of this heterogeneous disease associated with genetic disorders (Schaefer, Mendelsohn, 2008). Chromosome mutations and submicroscopic CNVs (copy number variations) and monogenic mutations Among them prevail as it is seen under a microscope. (Abrahams and Geschwind, 2008, Hughes et al., 2008, Iourov et al., 2008, Anney et al., 2010). Previously identified associations with autism gene neuroligin NLGN3 and NLGN4 (Jamai et al., 2003) and the gene, SHANK3, regulate the structural organization of dendritic spines (Durand et al., 2007). The analysis of genome-wide data also revealed strong signals due to multiple genes in autism: KIAA0564, PLD5, POU6F2, ST8SIA2 and TAF1C (Anney et al, 2010.). The genes associated with autism were discovered during exome-full sequencing (Butler et al., 2015).

The urgency of the variability of genome research, including CNVs, and single nucleotide substitutions (SNPs) in autism has repeatedly noted and concluded that using cytogenetic and molecular - cytogenetic techniques can be carried out in-depth analysis of the structural features of the genome in the group of persons with autism spectrum disorders.

The study of genetic factors underlying autism and the development of new molecular-genetic diagnostic methods are necessary for the provision of timely and proper care.

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Risikofaktoren für die Entwicklung der Ulkuskrankheit (Факторы риска развития язвенной болезни)

Die Ulkuskrankheit ist eine Erkrankung des oberen Magendarmtrakts, bei der sich ein Geschwür in der Schleimhaut bildet, welches die Tendenz hat immer wiederzukehren. Nur ein Teil der Betroffenen verspürt Beschwerden. Ein Teil verläuft beschwerdearm oder schmerzfrei. Es wird angenommen, dass etwa 10% der Weltbevölkerung an der Ulkuskrankheit leidet. Die Ulkuskrankheit (UK) ist eine chronische, rezidivierende Erkrankung, die durch die Bildung von Geschwüren im Magen oder Zwölffingerdarmwand gekennzeichnet. Abhängig von der Lokalisierung der Geschwüre unterscheidet man die Zwölffingerdarmgeschwüre und Magengeschwüre. In Russland leiden an Ulkuskrankheit, nach verschiedenen Schätzungen, von 1,5 bis 3 Millionen Erwachsene, 18 Tausend Jugendliche und etwa 10 Tausend Kinder unter 14 Jahren. In den USA jedes Jahr werden etwa 500 000 neue Fälle und 4 Millionen Rezidive vom Ulkus aufgezeichnet.

Derzeit wird davon ausgegangen, dass die Ulcuskrankheit ist eine multifaktorielle Erkrankung. Ulcerogenesis im Magen und Zwölffingerdarm ist das Ergebnis eines Ungleichgewichts zwischen den Aggressionsund Schutzfaktoren der Schleimhaut. Die wichtigste Aggressionsfaktoren sind: übermäßige Produktion von Salzsäure (aufgrund der erhöhten Masse der Belegzellen), die Überproduktion von Gastrin, Störungen des Nerven und humorale Regulation. Zu den Schutzfaktoren gehören die Sekretion von Bicarbonat, Magenschleim, Immunschutz und andere.

Zahlreiche Studien haben gezeigt, dass die wichtigste Rolle bei der Entwicklung von Ulkus gehört dem Mikroorganismus Helicobacter pylori (*H. pylori*), das in 90% der Patienten mit Zwölffingerdarmgeschwüren und 85% der Patienten mit Magengeschwüren festgestellt wurde. Die Entwicklung der Krankheit wird wegen der negativen Auswirkungen von *H.pylori* auf die Schleimhaut des Magens und des Zwölffingerdarms erfolgt, die ihre Schutzfaktoren schwächt. Die Häufigkeit der Vererbung wird bei den Patienten mit Geschwüren in 5,5-50% geschätzt. Die Gene von Matrix-Metalloproteinasen (MMPs) spielen eine wichtige Rolle sowohl in normalen physiologischen Prozessen (Morphogenese, Reproduktion der Gewebe) sowie in Krankheitsprozessen, einschließlich der Entwicklung vom Ulkus.

Wir analysierten die Häufigkeitsverteilung von Allelen und Genotypen von polymorphen Varianten der Gene von Matrixmetalloproteinasen: rs1799750 und rs494379 von MMP-1 bei Patienten mit Magengeschwüren und Zwölffingerdarm geschwüren und bei den gesunden Menschen aus der Republik Baschkortostan.

Während der Studie wurden die Hoch-Risikomarker sowie die Niedrig-Risikomarker von Ulkus in Gruppen der russischen und tatarischen ethnischen Zugehörigkeit identifiziert. Der Hoch-Risikomarker von der Ulkus bei Patienten der russischen ethnischen Zugehörigkeit zeigte Allel * 1 (rs1799750) und Genotyp * 1/1(rs1799750).

Der Hoch-Risikomarker von der Ulcuskrankheit bei Patienten der tatarischen ethnischen Zugehörigkeit zeigte Genotyp * 2/1 (rs1799750). © Валова Яна, 2016

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Der Einfluss von Blei und Zink auf die Aktivität der Bodenenzyme (Влияние свинца и цинка на активность почвенных ферментов)

Akkumulierende Schwermetalle vermindern im Boden ihr biologisches Potential. Dadurch kann der Boden allmählich seine Fruchtbarkeit verlieren. Die Angabe der Belastung mit Schwermetallen unter Verwendung der Test-Objekte, zu denen die enzymatische Aktivität des Bodens gehört, ist sehr wichtig. Enzyme sind eine biologisch wichtige Gruppe der Proteine. Sie katalysieren biochemische Reaktionen innerhalb und außerhalb lebender Zellen. Unter Bodenenzymen sind hauptsächlich extrazelluläre Enzyme zu verstehen, die sowohl mikrobiellen als auch pflanzlichen oder tierischen Ursprung haben können.

Die Enzymaktivität unter der Einwirkung von Schwermetallen auf die Böden ist wenig untersucht und die Forschung in diesem Bereich hat eine große Bedeutung für die Wissenschaft und Landwirtschaft.

Ziel der Arbeit ist die Bewertung der Auswirkungen von Blei und Zink auf die Aktivität der Bodenenzyme.

Aufgaben:

- die Auswirkungen der Verschmutzung von Blei und Zink auf die Aktivität der Redoxenzyme im Boden zu bewerten

- die Auswirkungen der Komplexverschmutzung auf die Aktivität der Redoxenzyme im Boden zu untersuchen.

Objekt der Untersuchung: Der alluviale Wiesenlehmboden ist der Gegenstand unserer Forschung im Ufaer Rayon, für die Aue des Flusses Djoma ausgewählt ist.

Für die Bestimmung vom Bodentyp haben wir den Bodenquerschnitt gemacht. Die Beschreibung des Bodenschnittes ist in Folie dargestellt.

Bestimmung der Bodenparameter und – der Enzymaktivität wurden von uns nach üblichen Bodenkundeverfahren durchgeführt. Der Schwermetallgehalt in der Trockenbiomasse von Hafer wurde durch Atomic Absorption Spektrometer AA-7000 Shimadzu gemessen.

Die Forschungen haben gezeigt, dass der alluviale Wiesenboden Carbonate, Sulfate und Nitrate, Humin- und Fulvosäuren enthält, der Boden ist der Lehmboden, die Bodenschicht ist wasserdicht, pH (Wasserstoffionenkonzentration) ist fast neutral.

Laborversuche werden mit der oberen Bodenschicht (A10-30cm) durchgeführt. Das Schema des Laborversuchs wird auf der Folie angezeigt.

Das wichtigste Bodenenzym der Oxidoreduktasen ist die Katalase. Sie beschleunigt den Prozess der Zerlegung des Wasserstoffperoxids und ist Kennzeichen der Bodenfruchtbarkeit. Wird der Boden mit dem Blei verunreinigt, vermindert die Aktivität der Katalase mit zunehmender Metallkonzentration, in dem Boden ist es von 15 bis 54%. Zink reduziert die Aktivität der Katalase in der Höhe von 14 bis 20%. Verhalten von Enzymen im Boden bei der Mono- oder Komplexverschmutzung von Schwermetallen kann verschieden sein, die Metalle können jeweils sowohl synergistische als auch antagonistische Zusammenwirkung haben. Bei der Komplexverschmutzung wird Enzymaktivität von 36 bis 81% reduziert. In diesem Fall wird ein Synergieeffekt von Metallen beobachtet.

Peroxidase oxidiert organische Bodensubstanz, in ihrer Aktivität wird die Abhängigkeit von der Metallkonzentration im Boden beobachtet. So führt zum Beispiel, Belastung mit Blei zur Erhöhung der Enzymaktivität von 7 bis 86%. Und wir haben durch die Belastung mit Zink in der Peroxidase-Aktivität das Wachstum beobachtet, dabei werden doch keine wesentlichen Veränderungen festgestellt. Komplexbelastung von Boden erhöht die Aktivität des Enzyms auf von 12 bis 21%.

Polyphenoloxidase sind bei der Transformation von organischen Aromaverbindungen an den Humuskomponenten beteiligt. Diese Enzyme spielen eine wichtige Rolle bei der Bildung von Humus. Blei reduziert die Enzymaktivität von 15 bis 54%. Wird der Boden mit Zink verschmutzt, so werden in Polyphenoloxidase-Aktivität keine signifikanten Veränderungen beobachtet. Die integrierte Verschmutzung durch Blei und Zink reduziert die Aktivität von 6 bis 49%. In diesem Fall wird die antagonistische Wirkung beobachtet.

Also, Enzyme reagieren empfindlich gegenüber Belastung durch Schwermetalle, insbesondere durch Blei. Bei der Komplexeinwirkung von Metallen wird der antagonistische sowie der synergiestische Effekt beobachtet.

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Overview of molecular genetic studies of gastric cancer (Обзор молекулярно-генетических исследований рака желудка)

Malignant tumors have acquired the character of global contemporary problems. More than 14 million of new cases of cancer are recorded every year all over the world and approximately 8.2 million deaths are caused by the disease. This affects the decrease in life expectancy, the growth of irreplaceable losses of population and enormous economic damage. Gastric carcinoma is one of the major causes of cancer-related mortality, which takes the fourth place in the world among malignant tumors and the second place among the causes of death from cancer pathology (Gonzales C., 2013). In the structure of malignant neoplasms cancer of this localization ranked the 5th place among women and the 4th place among men in Russia. About 5-10% of cases of gastric cancer have a family history. Molecular causes of the predisposition to gastric cancer are inherited mutations at high risk (70-83%) in several genes. The main ones include CDH1, MLH1 and MSH2 genes. CDH1 gene is considered as a specific tumor suppressor gene of familial gastric cancer. The frequency of mutations in this gene varies from 0% to 10% of all cases of familial gastric cancer in dependence of ethnicity study sample (Brooks-Wilson A.R., 2004). The discovery of the gene responsible for a genetic predisposition to the gastric cancer creates new opportunities for the diagnosis and prevention of this disease. Identification of mutations in the *CDH1* gene provides an objective criterion for the formation of groups at risk of gastric cancer development with the aim of prevention and timely diagnosis in the case of illness. An earlier age of gastric cancer due to highpenetrance hereditary mutations further emphasizes the importance of studying the characteristics of mutations and the practical use of the results.

Inherited mutations in the *CDH1* gene are shown for some cases of hereditary diffuse gastric cancer, but not all cases, and are not found in the hereditary intestinal gastric cancer (Caldas C., 1999). In this regard, other candidate genes are studied for genetic predisposition to gastric cancer. One of such genes is the Tp53 gene, somatic mutations which occur in many types of cancer, including gastric cancer. Additionally, inherited mutations in the gene give rise to Li-Fraumeni syndrome, which occurs in gastric cancer.

In the study of 34 probands with hereditary diffuse gastric cancer without mutations in the *CDH1* gene, held in Germany, one missense mutation (3%) in the *Tp53* gene was identified (Keller G, 2005). Families with gastric cancer may meet the criteria for the hereditary non-polyposis colon cancer syndrome (HNPCC). The disease is usually associated with inherited mutations in the *MLH1* and *MSH2* genes. Mutations in these genes are found in families with gastric cancer and colon cancer that do not meet criteria for hereditary non-polyposis colon cancer syndrome, as well as in gastric cancer families with no cases of colon cancer (Zhu M., 2013).

In 2011, Wang K. and his colleagues were the first to publish results of the whole exome sequencing at the next-generation sequencing technology of 22 DNA-samples from patients with gastric cancer (Wang K., 2011). As a result of this study, it was found that in patients with gastric cancer mutations in *ARID1A* gene was often found, and corresponding protein deficiency was observed, as a member of the SWI-SNF-related chromatin-remodeling protein family. In addition, scientists have shown that patients with different gastric cancer subtypes may have different spectrum of mutations in the *ARID1A* gene and negative association established for changes in the described gene to the presence of mutations in the *Tp53* gene. Wang K. and his colleagues helped to establish the important role of chromatin-remodeling processes in the pathogenesis of gastric cancer (Wang K., 2011).

The following year (2012), researchers from Singapore reported the results of the whole exome sequencing that engulfed more than 18 000 genes of the 15 DNA-samples of tumor and normal tissue of the affected organ in patients with gastric cancer (Zang Z. J., 2012). Zang Z. J. and his colleagues found that the analyzed samples had the most frequent mutations in the *Tp53*, *PIK3CA* and *ARID1A* genes. The analysis confirmed that there were the changes in the nucleotide sequence of the *FAT4* gene in patients with gastric cancer. This gene belonged to the E-cadherin family, encoded protein, it had been actively involved to cell adhesion processes. Showing frequent mutations in chromatin-remodeling genes (such as *ARID1A*, *MLL3* and *MLL*) the association of mutations in *ARID1A* gene with mutations in the *PIK3CA* gene was found. In addition, the authors found that *FAT4* and *ARID1A* genes may act as tumor suppressor genes, and their inactivation in somatic cells may be one of the key-mechanisms in the pathogenesis of different subtypes of gastric cancer (Zang Z. J., 2012).

Scientists from Korea in 2013 performed the whole exome sequencing of 4 DNA-samples of tumor and normal tissue of patients with

gastric cancer, which an appropriate diagnosis had been put at the earliest stages of the disease, and compared the data with the results of previously published studies Wang K. et al. (Wang K., 2011) and Zang Z.J. (Zang Z. J., 2012), where the patients with gastric cancer in the late stages of cancer pathology took part (Kang G, 2013). The aim of this study was to identify differences in the mechanisms of gastric cancer at different stages, to identify new prognostic markers and potential targets for therapeutic action. Researchers found that the 268 gene mutations (including *Tp53* gene) were found in patients at all stages of tumor development, whereas mutations in the 516 genes were found only in patients at early stages of tumor development, and 3104 genes (including as described in the previous two studies of *ARID1A* gene) were found only in patients at the late stage of the disease (Kang G, 2013).

Deaths from gastric cancer are at a very high level, despite the study of the disease more than 50 years, it is necessary to develop new diagnostic approaches, prognosis and treatment of disease.

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The impact of physical activity and mental and emotional state on the parameters of students' hemodynamics and physical endurance (Влияние двигательной активности и психоэмоционального состояния на показатели гемодинамики и физической выносливости у студентов)

The acquisition of increased educational material in combination with emotional tension, physical inactivity and poor physical development makes it difficult to adapt to the students' learning process and leads to a deterioration of their health. Based on the above, the purpose of the study was to investigate the effect of the level of physical activity (PA), the psychological status of the state of the cardiovascular system (CVS) on the physical stamina of the students. The study involved 226 students at the age of 18-22 of both sexes, clinically healthy according to the annual medical check inspection. The entire contingent of surveyed has been divided into groups according to their level of PA according to the WHO recommendations. The hemodynamic parameters, reserve capacity of blood circulation and physical stamina of students were determined. Psycho-emotional state (PES) was assessed by testing the level of personal (LPA) and situational anxiety (LSA) using Spielberg questionnaire. Personal scale of anxiety manifestations (PSAM) was determined by John Taylor questionnaire. The influence of PA and PES and the sex of surveyed on the studied indices was assessed by 3 factorial ANOVA. As a result, we found the most pronounced effect of three factors and their combinations on the adaptation potential (AP) of CVS characterizing the result of the body's adaptation to changing environmental conditions. Moreover, the level of anxiety (PSAM) affects the processes of boys' adaptation more than of girls'. At High Physical Activity (HPA) significant increase in anxiety causes the growth of the value of the AP, which indicates the stress of adaptation mechanisms [1]. The physical endurance was evaluated by the value of the cardiorespiratory index (CRI). In adynamic phase the influence of PES (LPA) was manifested in the reduction of the CDIP with increasing anxiety, clearly manifested in the active lifestyle. After the dosed physical activity young men with HPA are characterized by a decrease in exercise tolerance with increasing PSAM level. The exercise tolerance (CRI %) of girls leading an active lifestyle, increases with the level of anxiety. The level of LPA of boys with HPA did not significantly affect the CRI. Thus, students physical endurance, exercise tolerance and adaptation CVS reserves of students are affected not only by the level of PA, but also by psycho-emotional state. Given that in combination with PA these parameters are influenced by LPA, we can talk about a significant role in the emotional background of students to adapt to a variety of factors.

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Current state and main problems of the development of pharmaceutical branch in the Russian Federation (Современное состояние и основные проблемы развития фармацевтической отрасли в РФ)

Since the end of 2014 the Russian pharmaceutical market has appeared under the influence of the general economic situation in the country: devaluation of national currency, decrease in economy growth rates and purchasing power of the population, also geopolitical situation in the world, namely imposition of sanctions against Russia that has resulted in need of the state to change separate provisions of the legislation, for example in the sphere of price control, on vital and essential drugs, and to direct realization of policy on import substitution.

Let's consider the volume of the pharmaceutical market of Russia on segments in 4 qtr. 2015.

		1.1				
C	Volume, ble	mln. ru- es.	Profit,	Volum pk	e, mln. gs.	Profit,
Segment	4 qtr. 2014	4 qtr. 2015	%	4 qtr. 2014	4 qtr. 2015	%
Commercial segment of fin- ished pharma- ceutical prod- ucts	204 445	187 510	-8,3	1 173	968	-17,4
Parapharmaceut ics	50 632	47 563	-6,1			
Additional provision of medicines	16 917	14 645	-13,4	16	12	-27,5
Hospital audit	70 333	61 893	-12,0	322	275	-14,6
Total	342	311	-9,0	1 511	1 255	-16,9

The table 1 Volume of the Pharmaceutical Market of Russia on segments in 4

327 612

The commercial segment has shown decline by 8% in rubles and 17% in packings. And it should be noted that in December the decline during the same period of 2015 has made 14% in value terms.

When studying the problems of the development of the pharmaceutical market of Russia it has been revealed that the greatest impact on progress in pharmaceutical branch is exerted by current state of the Russian economy, and imperfection of the legislative regulation of the economy.

Further it is necessary to consider government measures the shares of import preparations directed to decrease:

- restriction or ban on participation in government procurement for foreign producers, makes 56%.

- state support of the Russian producers by granting various privileges and increase in investments into the Russian innovative pharmaceutical production, 49%.

Let's consider the first point in more detail. Today foreign producers can participate in state procurements in our country, so they cause difficulties with product sales for domestic producers.

There is a federal law No. 44-FZ "About contract system in the sphere of purchases of goods, works, services for ensuring the state and municipal needs" which includes a full cycle of procedure of purchases. However not all consider that this law completely satisfies domestic producers.

At this stage there are also problems with domestic suppliers. In this regard it was offered to improve this law and to make amendments. It is offered to adopt a number of bylaws namely if in the country there are not less than two producers of medicines and medical products, then foreign participants aren't admitted to trading.

If we achieve that in the country there will be a competition between domestic producers, then the quality of production will increase, besides there will be no need of cooperation with foreign suppliers.

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The investigation of associations of polymorphic Alu-insertion loci with length of life (Исследование ассоциаций полиморфных Alu-инсерционных локусов с долголетием)

Among the hypotheses about causes and mechanisms of aging there is one that draws our attention especially, the hypotheses about the role of genomic instability. One of the triggers genomic instability is the activation of Alu-elements under the influence of stressors. Question: can the Alu-insertional polymorphism influence the variability of the (length) of human life?

In the work the samples of 1603 people at the age of 20 - 109 were used all ethnic tatars living in the Republic of Bashkortostan. DNA extraction was performed by phenol-chloroform extraction method; genotyping for polymorphic Alu-insertional loci Ya5-MLS19 LA-MA2 gene (6q22-23) and Ya5as1986 gene Col13A1 (10q21.3) was carried out by PCR method; statistical analysis was performed using the SPSS software V.13.0.

Distribution of genotypes and alleles frequencies of Alu-insertion loci of Ya5-MLS19 LAMA2 gene (LAMA2 *I/*I-18,78%, LAMA2 *I/*D-48,1% and LAMA2 *D/*D-33,13% respectively) has been characterized. According to the results of logistic regression analysis among women chances of accumulation of genotypes LAMA2 *D/ *D at the age of 21 - 109 (p = 0.021; OR = 0.990) and LAMA2 *I/*I at the age of 60 - 79 (p = 0, 39, OR = 1.073) are reduced, while the probability of accumulation of genotype LAMA2 *I/*D at the age 25 - 109 (p = 0.25; OR = 1.011) increases.

Therefore, the genotype LAMA2 D'*D is a risk factor and genotype LAMA2 I'*D is a protective factor relating to the women's longevity.

The association of polymorphic Alu-insertion locus Ya5as1986 Col13A1 gene with the length of life: the frequency of genotypes Col13A1 *I/*I-55,76%, Col13A1 *I/*D-36,36%, Col13A1 *D/*D-7, 87%, respectively (p = 0.0826993).

According to the results of the logistic regression analysis of associations of I/D-polymorphic locus of COL13A1 gene with age, it can be assumed that in the population of tatars there are changes in the frequencies of the genotype that are happening in a considerable range of years. The frequency of genotype COL13A1 *I/*I is reduced in men in the range of 47 - 55 and women of 28 - 65, also the frequency of the genotype COL13A1 *D/*D is increased in the range of 29 - 56 for men and 73 – 109 for women.

Thus, according to the logistic regression analysis the probability of survival to the age of longevity is increased in carriers of the COL13A1 *D/*D genotype (p = 0.020, OR = 1.053).

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Besonderheiten der Oxydation mit Peroxyden von Kleinhirneiweißen während des Blutverlustes (Особенности перекисного окисления белков мозжечка при кровопотере)

Das Gehirn ist die zentrale Nerveninstanz aller Funktionen und Vorgänge im Organismus und weist eine sehr verletzliche, gallertartige Konsistenz auf. Die weiche und die harte Hirnhaut sowie der knöcherne Schädel üben eine wichtige Schutzfunktion aus.

Wie bei allen Organen besteht auch im Gehirn das Risiko einer Einblutung, das kann eine äußere Gewalteinwirkung, eine Gefäßmissbildung, oder chronische Arterienverkalkung sein. Blutungen aus dem arteriellen Hochdrucksystem führen in den meisten Fällen innerhalb kurzer Zeit zu einem lebensbedrohlichen Blutverlust, Blutungen aus dem venösen System hingegen sind in der Regel eher harmloser Natur. Durch die speziellen anatomischen Voraussetzungen des Gehirns liegen bei Hirnblutungen besondere Ausgangsbedingungen vor. Da sich der knöcherne Schädel nicht ausdehnen kann, führt eine Einblutung innerhalb des Schädels unweigerlich zur Drucksteigerung und damit zur Substanzschädigung des sensiblen Nervengewebes. Übersteigt die Blutung dabei ein bestimmtes Ausmaß muss mit primär noch reversiblen, nach Überschreiten eines kritischen Zeitlimits auch irreversiblen Schädigungen der Gehirnsubstanz mit entsprechenden neurologischen Ausfällen gerechnet werden.

Je nach zugrunde liegender Ursache weisen die Hirnblutungen ganz typische Lokalisationen auf. Während epidurale Hämatome Einblutungen zwischen knöchernem Schädel und harter Hirnhaut darstellen, sind subdurale Hämatome eine Etage tiefer, zwischen den harten Hirnhäuten lokalisiert. Noch näher an der Hirnsubstanz befinden sich die Subarachnoidalblutungen. Intrazerebrale Hämatome schließlich entsprechen Einblutungen im Inneren des Gehirns selbst.

Bei ausgedehnten Hämatomen jeglicher Lokalisation mit sekundärer Hirnkompression und -schädigung besteht zur raschen operativen Entfernung der Blutung keine gangbare Alternative. Das operative Verfahren besteht in der Aufstemmung des Schädelknochens in der fraglichen Region sowie der Entleerung des Blutergusses. Für die korrekte Operationsplanung ist ein Computertomogramm des Schädels unerlässlich. In dringlichen Notfällen muss der Schädel manchmal auch auf Verdacht hin aufgestemmt werden, um eine möglichst schnelle Druckentlastung zu erreichen. Selbst bei raschem chirurgischem Eingreifen besteht jedoch das Risiko eines tödlichen Ausgangs oder bleibender neurologischer Schädigungen.

Das Risiko für einen Schlaganfall steigt mit zunehmendem Lebensalter deutlich an, etwa 50% aller Schlaganfälle ereignen sich in der Altersgruppe der über 75-Jährigen. Aber auch junge Menschen können einen Schlaganfall erleiden. Schätzungen zufolge sind etwa 5% aller Betroffenen unter 40 Jahre alt.

Bei Gerinnungsstörungen können bereits kleine Verletzungen zu einem deutlichen Blutverlust führen. Größere Blutungen erfordern immer eine chirurgische Versorgung des Gefäßes beispielsweise durch Koagulation.

Extremfaktoren und auch Blutverlust beeinflussen die Modifikation von Biomolekülen der Membranen [1, 2, 3, 4]. Aus den wissenschaftlichen Quellen ist es bekannt, Dass die Oxydativprozesse von Eiweißen nicht genügend beschrieben sind [1,3,4].

Das Ziel unserer Gruppe besteht darin, um die Besonderheiten von Eiweißoxydation des Kleinhirns mit Peroxyden beim Blutverlust. Die Forschung wird mit den geschlechtsreifen Ratten Wistar durchgeführt. Es war der akute Blutverlust in Volumen 12%. Oxydative Eiweißmodifikation wurde im Kleinhirn erforscht, sie war auf Basis der Reaktion 2,4-dinitrophenylhydrasin mit der Bildung der 2,4dinitrophenylhydrasone und wurde spektralfotometrisch mit dem Gerät SF-26A bestimmt.

Ergebnisse: Experimente zeigen, dass Extremfaktoren wie der Blutverlust die Speicherung von Produkten der Oxydationsmodifikation von Eiweißen im Kleinhirn beeinflussen. Maximale Bildung von Produkten dieser Modifikation wurde im Laufe von 21 Experimenttagen bestimmt. Diese Ergebnisse zeigen auf die Wichtigkeit des freiradikalen Oxydationssystems als Bestandteil des Komplexsystems von Metabolismus und des Funktionalzustandes von dem nerven Gewebe [2]. Längere Einwirkung von Extremfaktoren (2 Blutverluste in der Woche im Volumen von 12%) führt zur Speicherung der Produkte der Oxydationsmodifikation im Kleinhirn. Im Grunde genommen waren diese Veränderungen im Laufe von 30 Tagen und Nächten ausgedrückt und später allmähliche Verminderung im Laufe bis 60 Tagen und Nächten. Diese Angaben zeigen, dass die Intensität der freiradikalen Oxydation von Eiweißen zunächst wächst und dann durch die Einwirkung von Antioxydanten abnimmt.

Die durchgeführten Studien zeigen, dass die freiradikale Oxydation von Eiweißen in ein komplexes, dynamisches System von Metabolismus der Eiweißstrukturen der Zellenmembranen als Elemente des Kleinhirns aufnimmt.

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ФИЗИЧЕСКИЕ НАУКИ

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Simulation of temperature distribution during drilling (Моделирование распределения температуры при бурении скважины)

One of the most effective methods for studying the Earth and solve practical problems of geophysics is a thermometer. For the most efficient use of thermometry is necessary to know the parameters of the Earth's natural geothermal fields. The process of restoring the natural temperature after drilling takes a long time, and, therefore, the geothermal temperature distribution can be measured only in a small number of long-term temporarily shut-in wells. It is not acceptable for the practice of oil field development.

The difficulty is in determining the geometric parameters of the field for transient processes, in particular during the recovery of natural rocks temperature after drilling. However, studies show that the earlier estimates of natural temperature of rocks are often inaccurate and reservoir temperature may be significantly underestimated. This work aims to develop a new method of determining the equilibrium temperature of permeable rock, disturbed by drilling. The idea is the mathematical modeling of a disturbance of the geothermal field for drilling wells and the restoration of the original natural distribution of the Earth's temperature by solving the inverse problem. The source data to be used in the temperature distribution of the measured drilling intervals, shortly after termination of the drilling and the data on the history of drilling (drilling rate, temperature and flow rate of drilling fluid, the drilling tool characteristics, etc.).

Set up of the problem:

The temperature distribution in the wellbore and formation during drilling is described by the following equations:

$$\begin{cases} \rho_m c_m S_d \upsilon_d \frac{\partial T_d(z,t)}{\partial z} + H_d(T_d(z,t) - T_a(z,t)) = -\rho_m c_m S_d \frac{\partial T_d(z,t)}{\partial t} \\ \rho_m c_m S_a \upsilon_a \frac{\partial T_a(z,t)}{\partial z} + H_d(T_d(z,t) - T_a(z,t)) + H_a(T_f(r_b,z,t) - T_a(z,t)) = \rho_m c_m S_a \frac{\partial T_a(z,t)}{\partial t} \\ \frac{\partial T_f}{\partial t} = \alpha \frac{1}{r} \frac{\partial}{\partial r} \left(r \frac{\partial T_f}{\partial t} \right)_{|_{r=r_b}} \end{cases}$$

The first equation describes the temperature distribution in drill pipe, the second one – the temperature distribution in annulus, the third one – the heat-transfer equation in rock. Non-linear system of equations is solved numerically. The paper describes the numerical algorithm and simulation results of the temperature distribution after drilling

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The simulation of the fluid filtration in fractured reservoir (Моделирование фильтрации жидкости в трещиноватом коллекторе)

The carbonate formations are widely distributed and contain a lot of oil. Because of these facts it is important to study the processes of filtration in such reservoirs. It is known that carbonate reservoirs have complex and changeable structure of void space. They often have natural fracturing. The reduction of the wells production rate in fracture formations may occur due to fracture network closure because of the pore pressure decrease.

The numerically simulated model of the fluid influx to the well taking into account permeability change of the fracture network from pore pressure is given consideration in this paper. Fluid filtration in the network of intrinsic fractures is described by the following piezoconductivity equation:

$$\frac{\partial P}{\partial t} \left(\frac{\partial \rho}{\partial P} \varphi + \rho \frac{\partial \varphi}{\partial P} \right) = \frac{1}{r} \frac{\partial}{\partial r} \left(\rho \frac{k}{\mu} r \frac{\partial P}{\partial r} \right)$$
(1)

The dependence of the fluid density, reservoir porosity and permeability from pressure is expressed by the following equations:

$$\rho = \rho_0 e^{c_l (P - P_0)}, \tag{2}$$

where c_1 is the fluid compressibility

$$\varphi = \varphi_0 e^{c_r (P - P_0)},\tag{3}$$

here c_r is the formation compressibility

$$k = k_0 e^{c_r (P - P_0)m}$$
(4)

and m is the exponent here.

At the initial moment of time the following boundary conditions in the well and on formation boundaries are as follows:

$$P|_{t=0} = P_0; P|_{r=r_e} = P_0; \left(r\frac{\partial P}{\partial r}\right)|_{r=r_w} = \frac{q\mu}{2\pi hk}$$
(5)

The numerical simulation of the production well operation process taking into account permeability change of the fracture network from the pore pressure has been implemented in this research.

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Dust-exhaust system for mobile treating machines (Аспирационная система для мобильных протравливательных машин)

The grain crop losses in Russia are 25-30% due to poor seed dressing. When stored for 5-6 months, the seeds are covered with

dust. When treating a little amount of drug is lost because of dust. It should be mentioned that up to 20% of the treater settle on the surface the poorly cleaned grain and dust.

Having analyzed these types of machines, it was found that the treating machines do not have cleaning system to remove dust and impurities.

In the designed dust-exhaust system the air forces away dust from the grain surface.



Figure 1.

The system includes the seed hopper (4), the cone (6) mounted on it the air manifold (3) with discharge (5) and (7) suction nozzles, the multi-cyclone (2) tough with the dust collector, the electric fan (1).

Seeds enter the system through the unloading auger, and then they are swirled in the hopper. After that the dust is ducted by the suction nozzle and goes into the multi-cyclone. The multi-cyclone removes the dust. The cleaned air is forced through the air manifold into the seed hopper by the fan.

The developed device provides high-quality seed cleaning. The recommend speed of the air flow in the dust exhaust system is 0.3-0.9 m/s.

The developed device is vitally important for farming as it provides cost effectiveness and contributes to environmental friendliness.

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Observation well testing between wells with a vertical hydraulic fracture in low-permeability reservoirs (Гидропрослушивание между скважинами с вертикальной трещиной гидроразрыва в низкопроницаемом пласте)

Now the development of low-permeability reservoirs is carried out using the hydraulic fracturing. In addition, fracture of spontaneous development formed in the injection wells as a result of the excess pump-in pressure over burst pressure of rock. The main objective is to study the propagation of the pressure field between the wells connected by man-made main crack in low permeability reservoir. Hydrodynamic parameters of the system are modeled on the basis of experimental data obtained by observation well testing.

We consider the system with two wells (active and observation wells), which are connected by a vertical crack of hydraulic fracturing. Permeability of fracture between the active and observation wells are much higher than the permeability of the formation. It is assumed that the formation is isotropic. Roof and base-surface of formation are fluidproof. We assume that the flow is one-dimensional in the fracture. We also consider that the fluid is with low compressibility, the viscosity of fluid is constant. The pressure distribution in the fracture (area $L_x \le x \le L_x + 2X_{fa} + 2X_{fo}$, $0 \le y \le w_{\downarrow}f/(2)$) is described by the equation:

$$\phi_f c_{ft} \frac{\partial P_f}{\partial t} = \frac{k_f}{\mu} \frac{\partial^2 P_f}{\partial x^2} + \frac{q}{W_f h},$$

where X_{fa} - half of fracture length in the active well, X_{fo} - half of fracture length in the observation well, w_f - crack-opening displacement, L_x -the distance to a formation boundary, h - the height of the formation. The pressure distribution in the formation is described by the equation:

 $\phi_m c_{mt} \frac{\partial P_m}{\partial t} = \frac{k_m}{\mu} \frac{\partial^2 P_m}{\partial x^2} + \frac{k_m}{\mu} \frac{\partial^2 P_m}{\partial y^2}$

By means of mathematical modeling of the system "well -fractureformation" and the solution of the direct problem pressure profiles were obtained along the fracture and formation. Also, a sensitivity analysis on the various inputs parameters of the system "fracture-formation" was performed.

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Die Weiterentwicklung des Gerätes für die Messung der Fördermenge (Усовершенствование устройства для измерения цикловой подачи топлива)

Betriebswirtschaftliche Kennzahlen in Dieselmotoren hängen von Regulierungsgenauigkeit der Hochdruckeinspritzpumpen ab. Einer der Ursachen der unzureichende Qualitätsregulierung der Dieselkraftstoffanlage ist Unvollkommenheit von Messgeräte, und zwar eine hohe Messungenauigkeit.

Zurzeit wird moderne spezialisierte Technik für Fixierung des Einspritzdiagramms eingesetzt. Sie sind für Forschungsziele vorgesetzt und werden in Servicezentren für Diagnostik der Kraftstoffanlagen nicht verwendet. Der Nachteil dieser Apparatur ist eine hohe Messungenauigkeit.

In einheimischen Standen werden verschiedene Geräte für die Messung der Fördermenge ausgenutzt. Messungenauigkeit wird dabei durch die Trägheit bestimmt.

Unser Ziel ist die Erhöhung der Messgenauigkeit von Fördermenge bei der Regelung der Dieselkraftstoffanlage durch Entwicklung des verzögerungsarmen Geräts.

Wir haben das früher erarbeitete Gerät für die Regelung der Dieselkraftstoffanlage weiterentwickelt. Es wurde die Schnelligkeit der bewegungsarmer mechanischer Teile des Messgerätes erhöht. Wir planen, das Interface für die Rechnung der Fördermenge auszuarbeiten (Schema 1).

Messgerät arbeitet folgenderweise: bei der Kraftstoffzufuhr steigt der Drück in der Messkammer auf. Dieser Druck bewegt den Kolben. Die Kolbenbewegung wird durch Streifengeber fixiert und verstärkt. Von Fördermenge hängt Kolbenbewegung ab. Diese Bewegung wird fixiert und in Datenverarbeitungsanlage ausgerichtet. Danach rechnet diese Anlage die Fördermenge, speichert sie in Datenmassiv. Der Computer gibt den Impuls für den Ventil Denso durch den elektronischen Baustein. Der Kolben bewegt zurück und drückt gemessene Menge des Kraftstoffes.



Nach der Bemessung der erforderlichen Fördermenge bestimmt die Datenverarbeitungsanlage maximale und minimale Einspritzverfahren, rechnet die Förderungleichförmigkeit des Einspritzverfahrens.

Das ausgearbeitete Messgerät kann genauere Messfördermenge ermöglichen, dadurch kann man den technischen Zustand der Dieselkraftstoffanlage schätzen.

Zurzeit wird die experimentale Forschung dieses Messgeräts durchgeführt.

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Die Entwicklung des intellektuellen Spiegels «Gideon» (Разработка интеллектуального зеркала «Gideon»)

Bei der Durchsicht der modernen Science-Fiction-Filme sind wir sehr oft überrascht, wie die Bequemlichkeit, der Komfort und die funktionale Ausstattung in den Steuerungs- und Alarmssystemen dargestellt werden usw. Heute sind diese Systeme bei weitem nicht von den Hollywood-Drehbuchautoren ausgedacht, das sind wirklich existierende Systeme. Dabei wächst der Markt der intellektuellen Systeme ständig, obwohl die Verbilligung dieser Systeme und Anlagen von Zeit zu Zeit geschieht.

Von einem der Filme inspiriert, haben wir beschlossen, den intellektuellen Spiegel zu entwickeln, wir haben diesen Spiegel «Gideon» genannt, da er viel Nutzen bringen kann. Wir haben vor uns die Aufgabe gestellt, den Spiegel zu erfinden, der während ihres Aufenthaltes vor ihm gewünschte und wichtige Informationen für den Benutzer übergeben wird, z.B.,aktuelles Wetter, das Datum und die Uhrzeit, Wechselkurse, Geburtstagserinnerungen, Nachrichten und Empfehlungen über den abendlichen Zeitvertreib.





Abbildung 1. Funktioneles Diagramm des Spiegels

Abbildung 2. Das Layout des intellektuellen Spiegels

Die Abbildung 1 präsentiert das funktionale Diagramm des intellektuellen Spiegels, der aus 3 Blöcken besteht: das sind der Spiegel, Monitor und Board-Computer «Raspberry pi 2». Wie uns die Abbildung 1 zeigt, ist die von uns entwickelte Konstruktion ziemlich einfach, gleichzeitig ist sie sehr funktionell und kompakt. Da das Betriebssystem bei der «Raspberry pi 2» - «Android» ist, wurde die Software unter «Android Studio» beschrieben.

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Factors influencing the formation of gas hydrates (Факторы, влияющие на образование газовых гидратов)

One of the most important issues of studying the kinetics of formation of crystals of the hydrate is the identification of different kinds of factors having a significant influence on this process. Such factors include the condition of the surface of the camera, the presence of different chemical compounds, dissolved in water, insoluble impurities, cooling rate of the reactor chamber, and the presence of different fields. It is noticed the change of speed of formation of crystal hydrate, depending on the illumination in daylight.

The process of crystal growth of hydrate is made significantly easier by increasing the speed of the gas stream, saturated with water vapor, the pressure pulsation, the introduction of small hydrate crystals or other nucleation sites etc.

In this work, we studied the effect of a constant electric field on the kinetics of hydrate formation in the reactor chamber, the inner surface of which is covered with different materials. The experiments were carried out with the materials such as steel, copper, bronze and PTFE. It was noted that the material of the reactor chamber also affects the generation of the first tender shoots of hydrate crystals, as the presence of a constant electric field. The impact affected not only the formation of the hydrate, but also its amount, spatial configuration and location. The aim of further research is to determine the pressure dissociation of hydrate obtained in a field in the cell with different inner coating.

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Horizontal Directional Drilled Wells (Горизонтальные буровые скважины)

Horizontal wells are high-angle wells (with an inclination of generally greater than 85°) drilled to enhance reservoir performance by placing a long wellbore section within the reservoir.

The average horizontal wells are more expensive and technically difficult to drill than the average vertical wells. Horizontal wells are being spudded in ever increasing numbers. Now, horizontal wells are considered to be an effective reservoir-development tool.

Directional drilling (or slant drilling) is the practice of drilling non vertical wells. It can be broken down into three main groups: oilfield directional drilling, utility installation directional drilling (horizontal directional drilling), directional boring.

The HDDW can be used for:

- Extraction of drinking water;
- Underground heat and cold storage;
- Redevelopment/ Decontamination;
- Stabilisation of Land and Dikes;
- Rain water infiltration;
- Groundwater management.

The massive new shale gas and oil resources discovered in recent years were made possible by the wedding of two technologies: Hydraulic Fracturing ("Fracking") and Horizontal Drilling.

The advantages of HDDW include:

• Reduced water and gas coning because of reduced drawdown in the reservoir for a given production rate, there by reducing the remedial work required in the future;

• Increased production rate because of the greater wellbore length exposed to the pay zone;

- Reduced pressure drop around the wellbore;
- Lower fluid velocities around the wellbore;

• A general reduction in sand production from a combination of Items 3 and 4;

• Larger and more efficient drainage pattern leading to increased overall reserves recovery.

The disadvantages of HDDW include:

- horizontal drill are slow because of the need to stop regularly;
- time consuming surveys;
- lower rate of penetration;
- high operational costs;

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Reliability improvement of electricity supply through the use of gearless electric drive (Повышение надежности электроснабжения путем применения безредукторного электропривода)

In engineering, especially in electrical and mechanical automated systems linear movements are very usual. These movements are mostly obtained by using rotating motors in combination with rotation-totranslation mechanisms. This function is typically performed by reduction gear. The drawback is that braking in rotating motors is difficult due to mechanical fixation of the drive load.

In many countries 60% of the electrical energy is converted into mechanical energy by electrical drives. The electrical drives are able to control the speed and the torque of the machine or the necessary process. Thus energy can be saved from a few percent up to 30%. Energy saving is important for the global economy and it requires a high responsibility of engineers.

A classical drive has a mechanical linkage between the motor and the machine. It can be any mechanism capable to transform the revolving motion to the linear motion. In the structure there are power loss sources in the motor. The same thing is also with the moments of inertia. The energy is at least twice converted.

A system using a direct drive is much simpler. A direct drive is characterized by the direct connection between the motor and the device. Accordingly there is at least one source with less losses of inertia. The mechanical drive as well as the mechanisms of changing the revolving motion to the linear motion are not necessary.

Less losses of energy costs and less inertia give higher dynamic characteristics. But there are some financial advantages: less space – less research efforts, less noise, less maintenance and no costs for the mechanical drive or other mechanism.

The research field of my scientific work is to improve the reliability of electricity supply and to reduce energy costs for agribusiness enterprises through the rational process control, the use of special electromechanical systems and renewable energy sources. The use of the gearless linear induction motor in the drive mechanisms with oscillating or reciprocating motion of the actuator seems to be more promising. The gearless electric drive is a motor directly connected with the operating mechanism, which is provided by the motion of the driving and the driven elements in one and the same coordinate. Moreover, when the motor element can be flat or cylinder equipment actuator, the simplification of the modular construction of the drive and its universal use become possible. There is a possibility of realization of the modern mechatronic electric drive of the technological machine. Such drives are not practically mass-produced, and the scientific content of the problem lies in the strict and full justification of the solution set according to the modern technical requirements.

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Linear Induction motors reliability (Надежность в линейных асинхронных двигателях)

The Linear Induction motor abbreviated as LIM, is a motor that produces motion in a straight line rather than a rotational motion. In a traditional electric motor, the rotor (rotating part) spins inside the stator (static part); in a linear motor, the stator is unwrapped and laid out flat and the "rotor" moves along it in a straight line.

The LIM construction is similar to the three phase induction motor. If the stator of the three phase induction motor is cut along the axis to the center and then is laid on a flat surface, it forms the primary LIM housing of the excitation system (inductor), and consequently the rotor forms the secondary element consisting of flat aluminum conductors with a ferromagnetic core for effective flux linkage.

There are two types of the LIM known as the double-sided linear induction motor (DLIM), and the cylindrical linear induction motor (CLIM), both of them are used to increase efficiency. DLIM has a primary winding on either side of the secondary, for more effective utilization of the induced flux from both sides. CLIM inductor has a cylinder shape and forms the motion of the magnetic field along the cylinder in the direction of the secondary element movement.

There is a scientific research laboratory at the Bashkir State Agrarian University where the research of the LIM is conducted. There is also a scientific school that studies how to increase the reliability of power supply and to reduce energy costs for agribusiness enterprises by means of the rational process control, the use of special electromechanical systems and renewable energy sources.

Low efficiency, low power factor, longitudinal end effect (LEE), and reliability are the major problems of the LIMs. These problems lead to high energy consumption and high input current that occupies transmission line capacity and phase unbalance. Thus, it is necessary to overcome these problems; furthermore, the decrease in motor weight results in lower cost and better productivity of linear induction motors. In our research work, to begin with, we represent an accurate equivalent circuit model (ECM) and study the influence of motor design parameters on the efficiency, power factor, and end effect intensity. Then, we develop several functions, which will be used to improve efficiency, power factor, end effect intensity and motor weight. This will be done by the use of analytic method and mathematical modeling method. The results will show the accuracy of the equivalent circuit model and the improvement of functions at the end of the optimization procedure.

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The development of diagnostics stands for Common Rail high pressure pump (Разработка стенда диагностирования топливных насосов высокого давления системы Common Rail)

It is impossible to diagnose Common Rail fuel pumps and nozzles without special technological equipment. Nowadays there are various modifications of both domestic and foreign manufacture. Most domestic and European diesel-powered cars are equipped with Bosch Common Rail fuel injection systems. But most repair shops cannot diagnose separate units of Common Rail fuel supply system accurately and reliably because of the lack of modern technological testing equipment.

A special model for the test stand for traditional fuel systems and Common Rail injection pump has been developed.

The designed stand consists of an electric motor (1), the rotation frequency converter (2) to change the operating regime. High pressure pump performance is measured by a flowmeter (10). Pressure sensor (5) is used for measuring maximum pressure generated by the high pressure pump and for controlling the pump tightness. Pressure control is per-

formed by the solenoid valve ZME (12). All signals from reading device come to the control unit, which in turn controls actuators.



Figure 1. Module for testing Common Rail high-pressure pumps: 1 – electric motor ; 2 - frequency converter; 3 - connecting box; 4 - control unit; 5 pressure sensor; 6 – jet-pipe; 7 – on/off valve; 8 - flowmeter; 9 - relief valve; 10 - fuel tank; 11 - high pressure pump; 12 - pressure control valve ZME; 13 - fuel filter; 14 relief valve; 15 - low fuel pressure pump

This system allows testing CR high pressure pump using five checking modes:

1) check for the maximum pressure at the pump starting mode; 2) check for the tightness of the injection pump; 3) check for pump elements operability; 4) check for the pump performance; 5) check for breaking conditions.

The developed module for testing Common Rail high-pressure pumps allows improving the quality of maintenance and repairing in the repair shops. Its cost is twice as little in comparison with existing analogues.

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The simulation of the thermal field of the layer with heat exchange with environment (Моделирование температурного поля пласта с учетом теплообмена с окружающей средой)

Thermal methods, which belong to Enhanced Oil Recovery methods (EOR), are based on increasing temperature in the layer around the well. They are used in the production of high-viscosity paraffin oils and bitumen. Our matter at hand is the problem of heat conductor injection in the layer for parametrization of the thermal recovery method. The fluid is injected into semi-infinite layer through the well with the radius r_w with the flow rate Q and temperature T_c , which is different from initial layer temperature T_0 .

Temperature and pressure distribution in the layer with heat exchange with environment can be described by the following equations:

 $\rho c \frac{\partial T}{\partial t} = \frac{\lambda}{r} \frac{\partial}{\partial r} \left(r \frac{\partial T}{\partial r} \right) - \upsilon (\rho c)_f \frac{\partial T}{\partial r} - \alpha (T - T_c); r_w < r < \infty$ and boundary conditions: $\begin{cases} T(r = r_w, t) = T_w \\ T(r, t = 0) = T_e \end{cases}$

If we solve this problem using automodelling method, we get the following expression for the temperature:

$$T(r,t) = T_c + (T_w - T_c) \frac{1}{\Gamma(\theta)} \int_{\rho c}^{\infty} e^{-\left(z + \frac{\alpha r^2}{\rho c 4az}\right)} z^{\theta - 1} dz, z = \frac{r^2}{4a(t - \tau)}$$

where: $\theta = \frac{Q}{4\pi ah} \frac{(\rho c)_f}{\rho c}, a = \frac{\frac{r^2}{4at}}{\rho c}, \text{ and } \Gamma(\theta) = \int_0^{\infty} U^{\theta - 1} e^{-u} du$ is

gamma-functions.

Numerical calculations of the given equation make it possible to define temperature distribution surrounding the well depending on injected fluid rate and the layer and heat conductor parameters.

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Methods of correcting the basic characteristics of the fuel injection control in diesel engine (Способы коррекции базовых характеристик управления подачей топлива в дизелях)

The paper describes methods of the correction of basic individual fuel injection characteristics.

Modern fuel system can carry up to eight injections per cycle, where every injection performs its own function.

Each injector, due to manufacturing tolerances and performance deterioration, has different cards of characteristics specifying the amount of fuel injection [1]. In order to ensure the identity of the cyclic supply by different injectors, the manufacturers range them in certain classes based on the card of determined injection characteristics and assign each injector an individual code, which is further carried in the engine control unit. These codes (injection characteristics) are written as labels, barcodes or QR codes on the injectors themselves, and a chip built into the injector stores the information. Correction procedure (ECM adaptation) is implemented with the help of different methods and devices. For instance, IMA correction method involves the quantitative card of correction (individual injector correction) [2].

The process of forming the characteristics codes is rather complicated and requires specialized equipment. In addition, different manufacturers of injectors have their own means of testing and assigning individual characteristics [3, 4]. Nevertheless, all manufacturers will continue using the correction codes for new injectors since factories produce a large number of injectors and it is quite difficult to ensure the identity of the work performance by other means.

Taking this method as a prototype, the task of our research is to develop a device and a method to test and adjust the nozzles of any manufacturer. Also, we have to program electronic control unit for injection correction taking into account the current wear over its whole life cycle.

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Modeling of In-Situ Combustion Process (Моделирование процесса внутрипластового горения)

The oil reserves extraction efficiency is unsatisfactory at the moment. The oil recovery factor (ORF) in the world varies from 35% to 75%. In Russia the ORF is about 37%, while in developed countries it reaches 65-70%. One of enhanced oil recovery methods is in-situ combustion. The use of in-situ combustion technology allows one to increase oil recovery up to 50-80%. The method is carried out by combustion of the heaviest fractions of non-recoverable oil. The in-situ combustion is a complex process of non-isothermal multiphase multicomponent filtration of fluids with the physical and chemical transformations.

The one-dimensional problem of combustion zone propagation is considered in conditions of non-isothermal three-phase filtration with phase transitions and chemical reactions in non-deformable porous medium. The mathematical model of the process includes equations of mass balance of phases, components, energy balance, and it is based on the following assumptions: liquid phases are considered incompressible; the gas phase is compressible and defined by the ideal gas law; phases have the same temperature and pressure; gas consists of water vapor, oxygen and inert gas; solubility of gaseous components in oil and water is neglected; process occurs under adiabatic conditions.

The problem is solved numerically by the finite volume method. With the usage of the selected numerical method, fields of pressure, temperature and saturation (oil, water and gas), and the concentrations of the components (oxygen, water vapor and inert gas) are calculated. The various cases of air injection into the reservoir, characterized by different physical and chemical properties of porous medium and fluids, are considered. It is shown that the process of oil self-ignition depends on oil activation energy and interaction between various physical processes that occur during injection of air into the reservoir: ignition of oil may not occur or the process can proceed with incomplete consumption of oxygen in the reaction zone. Dimensionless analysis of the process is carried out and a diagram of applicability of the in-situ combustion method for a particular field is built. The results of these studies are crucial for the successful implementation of the in-situ combustion technology on the real fields.

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Analysis of the efficiency of GIS methods on the example of a Western Siberia field (Анализ эффективности методов ГИС на примере одного из месторождений Западной Сибири)

In 2007, RN UfaRDIneft invited BSU Department of Geophysics experts to analyze commercial geophysical researches of one of the

fields in Western Siberia. As a result of analysis of materials essential violations of well logging technology were identified.

Actually, the real is that production wells equipped with pumps (sucker rod and EPSCP) have not been studied in the process. Special well logging to determine the state of development of the reservoir has not been conducted. Main volume of the measurements was carried out for the solution of problems related to the condition of the reservoir and wellbore diagnostics with the compressor development and use of injection mode. However, the accuracy of the results was low due to the lack of performance standards and various instruments and methods opportunities for contractors. Experts of the Department of Physics of the Earth and the planets have given some recommendations to eliminate the shortcomings.

Since that time 6 years have passed. In the course of my work, I got acquainted with the state of well logging in the field from 1989 to 2006. Downhole data for the period from 2010 to 2012 (given to me) were reinterpretated by me to analyze the dynamics of the effectiveness of well logging. I have made my recommendations for its further improvement:

- to refuse the storage well logging results in one LAS-file, because reducing the volume of stored data leads to irreversible loss of information content of well logging;

- to store back sight material together with the results of well logging;

- while developing the compressor different technological cards should be used depending on the task and well productivity;

- during the well logging with the use of injection mode attention should be paid to the autonomous apparatus, the application of which makes it possible to minimize the impact of the spout fluid on the wellhead.

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Determination of petrophysical dependencies according to production logging data and core (Определение тетрофизических зависимостей по данным ГИС и керна)

It is very important to define petrophysical relationships of various types for the Znamenskii field so well logging interpretation and productive layers petrophysical parameters obtaining is necessary to determine a calculation method of these parameters. The method can be based on core and production logging data analysis in the form of stable petrophysical relationships.

The purpose of research is to build petrophysical data dependencies according to production logging data and core.

To obtain the desired result we: 1) evaluate the information content of production logging data; 2) evaluate the information content of the results of core analysis; 3) identify the dependencies between production logging data and core; 4) build petrophysical dependence.

Core is an formation sample extracted from the well through specially designed for this purpose type of drilling. It often consists of a cylindrical column rock solid enough to maintain the solidity.

Geophysical methods of well research are a complex of physical methods used to study the rocks in the borehole and interwell spaces and for monitoring the technical condition of wells. Production logging data is divided into two categories of methods: methods of logging and borehole geophysical methods. Logging is intended for studying rock which is border to the wellbore (the radius of investigation is 1-2 metres).

There are 3 types of petrophysical dependencies: 1) core - core; 2) core -production logging data; 3) production logging data - production logging data.

We used the data of Znamenskii field to study these dependencies. The main results of the work on the definition of petrophysical dependencies according to production logging data and core are the following: 1. The dependence of core-core was not effective. The reason for this may be that the core was unpresentabe or core recovery was small.

2. Dependence of the core-production logging data turned bad. It can be concluded that it was influenced by the fact that the core was unpresentable and production logging data were interpreted incorrectly.

3. Dependence of production logging data-production logging data turned out good. The production logging data data were interpreted correctly and they can be used in the further processing of the field.

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Improving evaluation of the reliability of petrophysical rocks parameters with facial typification of petrophysical models (Повышение достоверности оценки петрофизических параметров пород с учетом фациальной типизации петрофизических моделей)

At the present time, there is a decline of unique oil-producing field extraction. Therefore, difficulties of building objects of the sedimentary cover cause particular interest. They are composed of different facies sediments. An example of this is the oil-bearing deposits of Almichurinskoe complex field.

This object is of interest, because a large quantity of hydrocarbons is included in his strata. The field is represented by fine-grained sandstone and clay with carbonate cement, gray siltstones with clay layers, and mudstone with pyrite inclusions.

The high geological risks (at high number of undrilled reserves) are associated with low permeability oil-saturated reservoirs. Residual reserves constitute approximately 70 million tons. Hence, the creation of reliable petrophysical dependencies and models are required.

The work purpose is to create petrophysical correlations and basis of petrophysical interpretation to produce logging data of non-uniform reservoir.

This will improve the accuracy of the calculation parameters.

The analysis of productive strata is with high core recovery (at least 70%) allows speaking the reliability of the data. In the study, more than 6,000 core samples taken from 34 layers were processed. On the results of laboratory determination of reservoir properties were built petrophysical functions for each strata: Porosity = f (Permeability), Residual water saturation factor = f (Porosity), Permeability = f (Residual water saturation factor), Density = f (Porosity).

Analysis of petrophysical relationships showed that some of the objects can be described by a single equation relating the relevant parameters, even if they are different lithological and mineralogical composition. However, not all beds can trace the connection between the parameters.

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Modelling the distribution of pressure and temperature in the gas wells (Моделирование распределения давления и температуры в газовых скважинах)

Technological mode of operation is determined by the gas well thermodynamic conditions of gas filtration in the formation and the conditions of gas flow in the well during the heat exchange with the surrounding rocks. The conditions of heat transfer at a gas filter in the reservoir and the gas stream flows through the well are different, but their parameters are determined by the same thermodynamic processes: throttling and adiabatic effects, convective and conductive heat transfer. To predict the conditions of formation of gas processing development and modes of operation of gas wells is necessary for investigating the hydrodynamics and thermodynamics of **a** complex mechanical system consisting of interconnected elements: a gas reservoir and gas flow through the well, the well itself and the rock.

To adequately describe the process of non-isothermal nonstationary filtration of gas in recent years there have been used numerical methods for integrating differential equations of gas filtration and energy conservation, as analytical solutions of these equations can be obtained only after the adoption of significantly simplifying assumptions.



 $*_Z$ Рис. 1. Multilayered reservoir and the well scheme

To simulate the thermal hydrodynamic processes at radial filtering in \mathbf{a} horizontal porous layer the following system of equations of non-isothermal gas filtration is solved. The porous media is considered to be fixed and solid. There are no phase transitions.

$$\begin{cases} \frac{\partial(m\rho)}{\partial t} + \frac{1}{r}\frac{\partial}{\partial r}(r\rho\upsilon) = 0\\ \frac{\partial p}{\partial r} = \frac{\mu}{k}\upsilon + \beta\frac{\rho}{\sqrt{k}}\upsilon^{2}\\ \frac{\partial}{\partial t}[m\rho h + (1-m)\rho_{sk}c_{sk}T] + \frac{1}{r}\frac{\partial}{\partial r}(r\rho h\upsilon) = \frac{1}{r}\frac{\partial}{\partial r}(r\lambda\frac{\partial T}{\partial r}) + \frac{\partial(mp)}{\partial t}\end{cases}$$

The first equation describes the mass balance, the second one is a law of motion (Forcheimer equation), the third one – the conservation of energy equation. These three equations are added by the gas equation

of state and other additional equations. Non-linear system of equations is solved numerically with respect to p(r,t), T(r,t) and v(r,t). The report discusses the algorithm for the numerical solution and the results of the research model.

Nomenclature m – porosity, v – filtration velocity, m/s t – time, s p – pressure, Pa μ - viscosity, Pa·s ρ – density, kg/m³ h – specific enthalpy (per unit of mass), J/kg T – temperature, K λ – coefficient of thermal conductivity, W/(m·K) ρ_{sk} – rock density, kg/m³ c_{sk} – rock heat capacity, J/(kg·K) © Файзуллин Наиль, 2016

Фаттахов Эмиль

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Petrophysical modeling of oil saturated transition interval (Петрофизическое моделирование нефтенасыщенных переходных зон)

Nowadays we have a lot of approaches to describe the dependence between porosity and permeability, which allow to take into account the fluid structure in the pore volume. However, identifying of exact petrophysical dependence is a hard task. In accordance with orthodox views, reservoir rock pore volume is considered to be saturated with water at the beginning and only later some part of the water was removed, and some left due to the capillary interactions. That is why transition internal appears. Most of Russia deposits have an extensive transition zone and water above oil-water surface. In this case we need to build transition interval model, based on core analysis, production log tests and production data for the success of reservoir management.

To build the correct petrophysical model of transition interval, core analysis data based capillary model of water-oil zone was build. Due to the fact, that we have a lot of approaches to build the capillary model, it was chosen to test 10 different models (Lambda, Leverett, Thomeer, Brooks-Corey, Kwon and Pickett, Johnson, etc) and then compare simulated data and real data. Increasing of capillary model adequacy achieved by attracting additional parameters, which allow to take into consideration the structural features of pore volume.

Constructed and investigated capillary and petrophysical models, appropriate model, which could describe terrigenous and carbonate rock reservoirs was chosen, dependences between porosity and permeability properties was described using capillary model and the model of transition interval.

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Passive elements in optical fiber communication lines. Simulation of characteristics of switch based on planar lightwave circuit technology (PLC) (Пассивные элементы в волоконно-оптических линиях связи. Моделирование характеристик переключателя на основе интегрально-оптической микросхемы)

Optical communication is one of the greatest successes people achieved in the last century. It provides an excellent solution for the flow of information. Different functional components including optical splitters,(de)multiplexers, and optical switches are required to add/drop signals.

Fiber optic splitter, also known as a beam splitter, is based on a quartz substrate of an integrated waveguide optical power distribution

device, similar to a coaxial cable transmission system. It is one of the most important passive devices in the optical fiber link. This optical fiber tandem device with many input terminals and many output terminals is especially applicable to a passive optical network (xPON, FTTx) to achieve the branching of the optical signal.

PLC splitter is a micro-optical element using photolithographic techniques to form optical waveguide at medium or semiconductor substrate for realizing branch distribution function. This optical device is based on planar lightwave circuit (PLC) technology. PLC splitters offer a better solution for application where larger split configurations are required. In order to achieve it waveguides are fabricated using lithography onto a silica glass substrate which allows to route specific percentages of light. Optical waveguides and devices can be fabricated by using different materials including LiNbO₃ (lithium niobate), SiO₂ (silicon dioxide), InP (indium phosphide), etc. Each material has advantages and disadvantages for a specific required function. For passive devices, SiO₂ is one of the most popular choices because of its outstanding advantages such as low cost, small propagation loss, and good matching to single mode fiber.

The design and simulation play a very important role in the development of the PLC devices. The design becomes much more efficient with suitable simulation of tools. Using efficient designs providing good performance and compactness, the cost for product development could be reduced dramatically.

PLC technology has now matured to the point where complex optical instrumentation can be integrated into a single system-on-chip. PLCs will continue to be used in the telecommunications domain where they have steadily grown in market reach. Despite complicated production process, they have the advantages of a small size, high reliability, possibility for large scale production, and potential integration with electronics. As a general conclusion, PLCs are one of the most promising technologies for realizing optical components in communication systems.

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Structure of the amorphous in melt-spun Ti₅₀Ni₂₅Cu₂₅ alloy, subjected to high pressure torsion deformation (Структура аморфного быстрозакаленного сплава Ti₅₀Ni₂₅Cu₂₅ подвергнутого деформациям кручения под высоким давлением)

Recent studies have shown that severe plastic deformation (SPD) processing can be used not only for grain refinement in metals, but also to produce the amorphous or amorphous-nanocrystalline states. Plastic deformation in amorphous alloys occurs by shear bands, and this leads to certain structure transformations and properties. It has been shown recently that SPD processing by HPT can lead to a transformation of the amorphous structure. For example, in the case of Nd-Fe-B MS amorphous alloys, HPT processing leads to separationof elements and nanocrystallization of α -Fe-nanocrystals (with a size of ≈ 20 nm) in the amorphous Ti-Ni-Cu alloy does not lead to intensive nanocrystallization and in this connection, of great interest are more detailed studies of the evolution of the amorphous structure in this Ti-Ni-Cu alloy during HPT processing and its influence on the alloy's properties.

The amorphous $Ti_{50}Ni_{25}Cu_{25}$ alloy was produced by melt spinning, melt-spun (MS) which allows to obtain thin ribbons by cooling the melt with a high cooling rate (up to 10^6 K/s).

The amorphous melt-spun (MS) $Ti_{50}Ni_{25}Cu_{25}$ alloy has been subjected by high-pressure torsion (HPT) at temperatures of 20-150°C.The bright-field TEM images (BF) of the alloy change as a result of HPT processing: after HPT at T=20°C in the BF there can be seen amorphous clusters with a size of ≈ 25 nm, separated by darker interfaces. The alloy subjected to HPT at T =150°C remains predominantly amorphous, although the fraction of nanocrystallization. In the case of HPT at T =150°C, in the

BF there can be seen clusters with a size of ≈ 40 nm, separated by brighter interfaces. DSC shows that the temperature of crystallization start decreases from 445° C in the initial as-spun ribbons to 400 °C after HPT processing at 20°C, and to 420 °C after HPT processing at 150°C. These changes may be connected with the chemical separation and evolution of free volume in the amorphous phase, and they are determined by the temperature of HPT processing. Autors acknowledge gratefully the Russian Science Foundation for the financial support of the research, project $N_{\rm e}$ 14-12-00138.

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Thermal field simulation surrounding the well with hydraulic fracturing crack under thermophore injection (Моделирование температурного поля вокруг скважины с трещиной гидроразрыва при закачке теплоносителя)

Nowadays due to permanent price increase on hydrocarbon material and gradual depletion of reservoirs with the "high-gravity resources of oils", large attention is paid to the development of high-viscosity oils (HVO) and bitumens. World experience of HVO and bitumens extraction showed that the most potential technology of their development are thermal methods of crude-oil production.

The work objective is research of thermal flooding of layer with the hydraulic fracturing crack. In the layer, saturated by high-viscosity oil (by a bitumen), in sole part, the horizontal hydraulic fracturing crack is created. Injection of thermophore is produced through this crack over a period of time sufficient for producing the warmed up zone of certain width (breadth) in the layer. In this zone high-viscosity oil acquires mobility and henceforth the injection of the implacement agent is carried out. Determination of technologically important characteristics of a considered process by means of mathematical modeling presents some certain interest. They are:

- temperature distribution in a crack and in a layer, during the injection process;

- time of thermophore injection into a crack, necessary for creation the warmed up zone of the given power in the layer;

Temperature distribution in the stage of injection of thermophore in a crack we will explain on the basis of Lowery model.

$$T_2(z,r,t) = T_0 + (T_w - T_0) \operatorname{erfc}\left(\frac{z + \frac{r^2 \lambda_2}{4\theta \rho c a_2 h}}{2\sqrt{a_2 t - \frac{r^2}{4\theta}}}\right) H\left(a_2 t - \frac{r^2}{4\theta}\right)$$

H(x) – Heaviside function, (where *T*- temperature,

 $\theta = \frac{Q_0}{4\pi a_2 h} \frac{(\rho c)_f}{\rho c} - \text{convective parameter, temperature in the layer } \frac{T_1(r,t)}{r_1(r,t)} \text{ is}$ defined by $z=0, T_w$ -temperature of injected fluid in the crack, c_f is a heat capacity of fluid, λ_2 and c_2 is a heat of conductivity and a heat capacity of layer. (Index 1 behaves to the crack, index 2 - to the layer.)

The results of the research can be used for the estimation of efficiency of thermal technologies application depending on physical and chemical properties of layer and thermophore.

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ХИМИЧЕСКИЕ НАУКИ

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Supramolecular organization of chitosan succinimide in a mixed solvent of water-ethanol (Надмолекулярная организация сукцинамида хитозана в смешанном растворителе вода-этанол)

Currently, the scope of bio- and hemocompatible materials based on naturally occurring polysaccharide chitosan (CTS) and its derivatives is very broad, from disaster medicine, to tissue engineering.

It is known that some patterns of physical-chemical properties of the materials formed from the polymer solution reflect gelation of the polymer macromolecules in solution. In the present work for targeted controlling the processes of aggregation and formation of the physical network of links in the solution of water-soluble derivative of CTS sodium salt succinamide chitosan (SCCTS) - an approach based on the deterioration of the quality of the solvent, namely, on the use of a solvent of water-ethanol mixtures of different volumetric ratios is used.

We used SCCTS with Mw = 207 kDa and an intrinsic viscosity $[\Box] = 3.60 \text{ dl} / \text{g}$, manufactured by JSC "Bioprogress" (Shchelkovo). SCCTS degree of substitution on the amino groups is 75%. The degree of deacetylation of CTS original sample from which SCCTS was obtained, was 82%. SCCTS solutions in a mixed solvent were prepared by carrying out dissolution in water, pre-diluted by alcohol in a volume ratio of 90:10 and 80:20 vol%. Rheological measurements aqueous and aqueous-alcoholic solutions SCCTS were carried out on a dynamic rheometer at 25°C HaakeMars III in continuous shear deformation mode at shear rates ranging from 0.1 to 100 s⁻¹ and in the oscillation mode.

The study of molecular and supramolecular organization of SCCTS solution showed that the polymer without aggregating in dilute (up to the crossover point) aqueous solution in a mixed solvent of water - ethanol aggregates even at high dilutions. Pattern formation of the

polymer in solution is accompanied by the formation of an additional network of physical links, whose nodes are aggregates of SCCTS macromolecules formed in a mixed solvent, and promotes earlier formation of viscoelastic properties.

Transition to viscoelastic systems for the elastic-viscous solutions in STNmixed solvent begins at SCCTS lower concentrations than in the case of aqueous polymer solutions. It can be seen, at a solution concentration of 2.5-3% by weight SCCTS and above in a mixture of ethanolwater with a volumetric ratio of 20:80 vol%. the value of modulus in aqueous ethanol solutions is higher than modulus values. Moreover, the greater the content of ethanol in the system, the greater the contribution to the overall elastic component of viscosity increase.

The differences in the dynamic properties of the individual and the mixed solvent polymer solutions remain at the transition to a condensed system.

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Determination of kinetic parameters of chitosan enzymatic hydrolysis in the acetate buffer solution (Определение кинетических параметров ферментативного гидролиза хитозана в растворе ацетатного буфера).

Currently, medicine needs not only biostable polymers but degradable ones (under control), too. Chitosan polysaccharide can be mentioned as an example. In earlier works [1, 2] the process of enzymatic degradation of chitosan in acetic acid solution was considered. However, the operating conditions of the chitosan material in this solution are not clear enough. It is extremely important to study the process of enzymatic degradation of chitosan in solution which pH is close to the conditions where it may be potentially used. Therefore, we studied the process of enzymatic hydrolysis in the acetate buffer with pH = 4.8, in the superalkaline acetate buffer, in which dissolves the used sample of chitosan. As objects of study we used chitosan with molecular weight Msd = 113,000, and enzyme - hyaluronidase. The pH-value of solutions was controlled by pH - analyzer ANION 4100. The concentration of chitosan in the solution during the fermentation process of hydrolysis (CGC) ranged from 0.1 to 5 g / dl. Inherent Chitosan viscosity in the solution of acetate buffer was determined by Ubbelohde viscometer at T = $25^{\circ}C\pm 0,1$ C. The value of the initial speed of enzymatic hydrolysis V₀ was calculated by the formula:

$$\mathbf{V}_{0} = \mathbf{C}_{\boldsymbol{\Phi}^{\mathrm{r}}} \cdot \mathbf{K}^{1/\alpha} \cdot \frac{[\boldsymbol{\eta}]_{t}^{1/\alpha}}{t} [\boldsymbol{\eta}]_{0}^{1/\alpha}$$

where C - the concentration of chitosan, by the processing of enzymatic hydrolysis in the solution (g / dl); t - time of hydrolysis, min .; K and α - constants in the equation of Mark-Kuhn-Houwink. The research showed that enzymatic hydrolysis of chitosan in acetate buffer solution with pH = 4.8 is characterized by a higher rate of chitosan degradation, than in acetic acid's solution. This fact is connected obviously with increasing activity of the enzyme in the solution which pH-value is closer to the pH-optimum of hyaluronidase.

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Molecular interactions between vapors of organic substances and the surface of fine-pored polymer, modified by uracil (Исследование межмолекулярных взаимодействий паров органических веществ и поверхности микропористого полимера, модифицированного урацилом)

Some uracils are capable to form supramolecular variasized structures of grid type, containing in the pore space certain groups. It was found that these pore spaces in the structure of grid type can lead to size effects in the adsorption of organic molecules. However, it remains unexplored the question of quantity of modifier applied, required for the formation of a mesh structure. Also it isn't studied the question about polarity change on the surface of adsorbents during the modification. Therefore, it is the matter of special interest to study the formed supramolecular structure more detailed and its influence on the polarity of the surface.

As the original sorbent was selected fine-pored polymeric sorbent Dowex L-285 - copolymer of styrene and divinylbenzene with a specific surface of 800 m2/g and average pore size of 25 Å. For the surface modification of the adsorbent was used uracil, which was applied on the surface in quantities 10^{-4} %, 10^{-3} %, 10^{-2} %, 10^{-1} %, 1%, 5% to the weight of the polymer sorbent. Specific retention volumes were determined by the method of inverse gas chromatography at infinite dilution of the samples on the chromatograph "CHROM 5" at the speed of 30 ml/min of gas carrier - nitrogen.

The polarity of the surface was evaluated by the sum of contributions of various molecular interactions to free energy, which was calculated by the method of linear decomposition of free adsorption energy.

It was found that with increasing amounts of applied uracil the polarity of the surface increases only up to pC=3, then the polarity is reduced. This phenomenon has to do with the formation of supramolecular structures when the amount of applied uracil is 0,1% and higher. As a result molecules of uracil form hydrogen bonds not with molecules of test-solutes, but among them, which leads to energy reduction of donor-acceptor interactions and reduces total polarity.

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OXIDIZING METHODS OF POLYSACCHARIDE MODIFICATION (Окислительные методы модификации полисахаридов)

Polysaccharides and their derivatives have found widespread use in biotechnology, food, cosmetic and other industries and they also get the increasing value in medicine and pharmacy. Introduction of carbonyl, carboxyl, sulphatic, phosphatic and other functional groups and lowmolecular fragments to their molecules leads to the creation of the most valuable medicines (for example, lakricine, polifer, polycapran, terridekaza, streptodekaza and others). Therefore modification of biologically active agents by polysaccharides, for example, chemical fixing of medicinal substances on a polisaccharide matrix, allows to create pro-drugs, new long-acting preparations with low toxicity and necessary balance of lipophilic and hydrophilic properties. Natural polymer starch has unique properties, and its derivatives in many areas can compete with cellulose derivatives, especially, in view of the fact that starch is received from annually renewable raw materials (potatoes, corn, rye) unlike the cellulose that is emitted from wood the minimum maturing period of which is 18-20 years. By chemical modification of starch the large number of simple and complex starch esters and also the graft copolymers of starch possessing valuable, and in some cases unique properties is received.

Even the fluent review of publications and patents on synthesis and application of starch derivatives confirm considerable interest of researchers and the major companies in starch derivatives, many of which produce modified starches for various fields. Besides modification of hydroxyl groups of a glucose cycle in a starch macromolecule by nucleophilic replacement of hydrogen atom there is also a number of methods to change a polemer carbon skeleton. First of all they include oxidizing transformations by 2,3 – diol groups in the pyranose cycle.

Using permanganate, hypochlorite, peroxides, iodic acid the oxidized starches can be obtained. Starch is oxidized in water suspensions. The oxidized starches, in comparison with the initial ones, are capable of giving less viscous, but more transparent and stable pastes. The dialdehyde starch received under the influence of iodic acid (with oxidation level to 2%), is used in bread baking, it has the strengthening effect on flour gluten. Cellulose derivatives and the cellulose regenerated from its connections are valuable industrial products used for the production of plastics, textile products, food packaging, films, varnishes, explosives, sponges, bands, tapes, covers, artificial straw, horsehair and a number of other products.

People have recently learned to receive cellulose derivatives dissolved in water or diluted in alkalis which are massively used in textile products.

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The copolymerization of methyl-butadiene with styrene in the presence of metallocenes (Сополимеризация изопрена со стиролом в присутствии металлоценов)

Currently, the copolymerization is the main method of obtaining polymers with desired chemical and physical properties. The reason is that in most cases it is difficult to control the properties of homopolymers, and the need for such a regulation for obtaining materials for various purposes exists.

In recent works devoted to the complex-radical polymerization of vinyl monomers, as additives, regulating the composition of the copolymers, it is proposed to use systems based on traditional initiators and organometallic compounds, especially metallocenes, which have a modifying effect on the catalyst being introduced into the system in catalytic quantities. Supplements of metallocenes affect significantly the initial polymerization rate and molecular characteristics of the polymer. At the same time the question of the impact of metallocenes on the parameters of copolymerization processes is open. The primary objective of this work was to study the feasibility of the synthesis of polyisoprene and isoprene-styrene copolymers on the catalytic system "benzoyl peroxide - ferrocene", and the definition of the copolymer composition.

Molecular weight (M_w and M_n) of the copolymers was determined by gel chromatograph "Waters Alliance GPC 2000", at the temperature of 80 ± 1 ⁰C, eluent – toluene. A system of three columns filled with styragel was calibrated by polystyrene standards with a narrow MMD ($M_w/M_n \le 1.2$). Molecular weight of the isoprene copolymer and styrene was determined by 100% polystyrene-samples and by recalculation to polyisoprene.

The calculation of the microstructure of (co)polymers was performed using ¹H and ¹³C NMR spectroscopy on the AM-300 "Bruker" equipment (solvent – CDCl₃, the operating frequency is 300 MHz for ¹H and 75 MHz for ¹³C).

The percentage (% mol.) of comonomers of the copolymerization product correspond to the percentage composition of the starting Monomeric mixture, that is, r1 = 1, r2 = 1 (azeotropic copolymerization). With increasing of the molar content of styrene in the products the glass transition temperature of the copolymers tends to monotonic increasing from -70 0 C (polyisoprene) up to 93 0 C (polystyrene), which also points to the statistical character of the distribution of monomer units in the chain.

[Polystyrene], mol %	T _{ct} , °C
0	-70
30	-31
60	-30
80	6
100	93

Formed in the presence of ferrocene copolymers are irregular on microstructure. The contribution of the various structures of polyisoprene sequences has the following percentage ratio: TRANS-H-T – 42 %; TRANS-H-H – 11 %; TRANS-T-T – 11 %; CIS-H-T – 21 %; CIS-H-T – 5 %; 3,4-addition – 2.5 %; 1,2-addition – 2.5 %. Thus, metallocene influence in the system of the copolymerization on the composition of the copolymer in an explicit form was not revealed.

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Increase of viscosity in the chitosan succinamide sodium salt -TWEEN-80 - sol silver iodide system (Повышение вязкости системы сукцинамид хитозана -TWEEN-80 - золь иодида серебра)

One of the characteristic features of polyelectrolytes solutions is the change of their rheological behavior when introducing charged molecules, micelles or colloidal particles into the solution. For example, a spontaneous increase in viscosity may occur due to non-covalent (hydrogen, hydrophobic, electrostatic, etc.) interactions under the water solutions blending. Similar effects have been described for different systems. The aim of this work is to expand the number of polyelectrolytes for which the characteristic features of rheological behavior have been identified. In this research chitosan succinamide sodium salt (CSSS) that is a water-soluble chitosan derivative known for its unique properties was used as an ionic polymer, while silver iodide sol micelles were used as colloidal particles.

As it was demonstrated by the conducted research the introduction of silver iodide sol resulted in the reduction of c_e concentration value (concentration at which an engagement grid begins to form), indicating the earlier formation of an entanglement network. Obviously, this fact is related to the fixation of network junctions by micelles of silver iodide sol due to the specific polymer adsorption on the sol surface. Thus it can be assumed that at the concentration above c* (crossover concentration at which the macromolecular tangles (coils) overlap begins) a dual grid system is formed with colloidal particles of silver iodide sol and macromolecules engagement as the grid junctions.

Since the viscosity increase in the CSSS - TWEEN-80 system hardly occurs, a solution of micelle-forming non-ionic surfactant -TWEEN-80 was added to the CSSS-sol silver iodide system in order to enhance the interaction between the components of the polymercolloidal dispersion at the concentration above the CMC (critical micelle concentration). In the presence of surfactants the observed CSSSsol viscosity increase is significantly higher than in its absence. With high probability we can assume that the increase in viscosity of the sol-CSSS system of AgI-TWEEN-80 occurs due to the strengthening of the interaction between the sol micelles and the CSSS.

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The new chiral unit from L-maltic acid (Новый хиральный блок из L-яблочной кислоты)

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In a long organic synthesis great attetation is paid to create isomerically pure chiral unit-sintons, which will be used in the synthesis of different kinds of natural compounds. Our target was to obtain «protected» acetylidetion fragment, which contained methil group with *S*configuration. This unit was planned to use for building C^6-C^9 -segment chain of epothilone molecule[1]. We have developed a simple and efficient synthesis of pure diastereomers synthon unit 3 of L-malic acid 4.



Step 5 Alkylation of ester proceeded to form an inseparable diastereomeric mixture (dr 6: 1) with a primary content of the desired isomer 6. After the blocking of the hydroxyl groups in the form of 8 benzylideneacetone, diastereomers ewere asily separated by column chromatography in SiO2. Introduction of aldehyde 8 in Corey-Fuchs reaction [2] gave the desired 3 acetylide (de 99%, HPLC).



Reagents and coditions: MeOH, CHCl3, H2SO4 cat., reflux, quant.; b) LDA, THF, MeI, -78 0C, 80%; c) NaBH4, EtOH, reflux 95%; d) PhCH(OMe)2, C6H6/MeOH (3:1), p-TSA cat., 73; e) (COCl)2, DMSO, Et3N, CH2Cl2, -70 0C, 96%; f) CBr4, PPh3, CH2Cl2, 0 0C, 85%; g) Bu Li, TMSCl, -78 0C to rt, 88%/

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Entwicklung der biokatalytischen Systeme (Разработка биокаталитических систем)

Enzyme bestimmen Geschwindigkeit und Gezieltheit biologischer Prozesse von allen Lebewesen. Enzyme sind Protein – Katalysatoren. Sie unterliegen denselben Gesetzen, wie Katalysatoren nichtbiologischer Herkunft. Ökologisch und wirtschaftlich ist die Anwendung von Enzymen viel vorteilhafter. Enzyme funktionieren mit einer größeren Geschwindigkeit und wirken dabei viel behutsamer, als chemische Katalysatoren. Enzyme sind sehr spezifische: sie werden durch ohne hohe Selektivität charakterisiert. Das Enzym-system einer lebendigen Zelle sorgt für den synchronen Verlauf einer Vielzahl von Reaktionen, und ermöglicht es, an die nötige Substanz in einem Schritt heran zu kommen, ohne die Mehrstufensynthese, wie es bei den chemischen Katalysatoren der Fall ist.

Biokatalytische Synthese verlangt mehrere Schritte. Am Anfang wird ein Mikroorganismus herausgegliedert, der für die gewünschte Transformation sorgt.

Darauf wird der aktivste Stamm gewählt. Reaktion muss eine hohe Ausbeute zeigen. Mutierte Zellen kann man auch mit Hilfe von genetischer Methode bekommen, indem man die nötige DNA in einem entsprechenden Mikroorganismus kloniert. Danach werden optimale Bedingungen gewählt, wie Temperatur, Belüftung, Azidität, Nährmedien, Verrühren. Die nächste Etappe ist Skalierung. Mikroorganismen werden üblich in einem Fermentationstank vermehrt. Das Volumen eines jeden daraufkommenden Tanks muss viel größer sein. Die Kapazität eines Tanks kann mehrere Dutzend von Kubikmetern (m³) betragen.

Dann wird das Produkt mit Hilfe von physikalischen oder chemisch-physikalischen Methoden ausgesondert, gereinigt, und – verpackt.

Die gewonnene Substanz kann als Ausgangsstoff für solche biologisch aktive Stoffe dienen, wie Hormone, Antioxidanten, Antikrebsmittel (wie Betulinsäure) und für Pflanzenwachstumsstimulanzien.

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Polyarylenephthalides - ''smart'' materials for the production of light-emitting diodes (Полиариленфталиды - как «умные» материалы для производства светодиодов)

The main scientific and applied interest in modern materials science has been the creation of so-called «smart» materials, capable of high sensitivity to environmental influence and response to external stimuli (electrical or magnetic field, light, temperature, pressure, solvent, etc.). From the large family of the polymers, conducting polymers may be considered to be valuable candidates in this class of materials. They may be incorporated into electronic devices: polymer batteries (that are already commercially available), diodes and light-emitting diodes or light-emitting electrochemical cells). Their utility in technology derives from the way in which their conductivity or electro-optical properties may be changed and controlled by modifying their chemical composition. [1, 2].

Phenylenes- are "smart" materials and based materials form one of the most extensively studied classes of conjugated molecules for use in organic electronic devices such as light-emitting diodes (LEDs), polymer lasers, field-effect transistors (FETs), and solar cells. One of the main reasons for this interest has been their potential use as blueemitters in LEDs. The search for stable blue-light-emitting materials is one of the main goals of research into luminescent oligomers and polymers. Poly(para-phenylene) is an insoluble, infusible material, such thin films suitable for the use in devices must be prepared by precursor methods. Polyphenylenes is a typical conjugated, electroluminescent polymer for light emitting devices in combination with excellent mechanical properties and thermal and thermooxidative stability [3]. Unfortunately, PPPs are insoluble in many organic solvents, which limit their processability. Therefore, attachment of conformational mobile alkyl side chains to the backbone has been important because it has allowed the controlled synthesis of soluble and processable PPPs with high molecular weight [4].

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The magnitude of the energy gap HOMO/LUMO as a new characteristic of the uracil derivatives coupling (Величина энергетического зазора HOMO/LUMO в качестве новой характеристики сопряжения производных урацила)

Uracils derivatives belong to the most important pyrimidines that play a key role in the structure and functioning of nucleic acids, enzymes and some pharmaceuticals [1]. In uracil molecules and it's derivatives a signified trend of electron delocalization and the formatting of a union coupled electron structure is present. Delocalization and coupling are essential, but insufficient for aromaticity. Aromaticity is the most important and viable concept of chemistry, which allows us to evaluate the structure, stability and the reacting capacity of multiple molecules more adequately. Aromaticity is of the quantum nature, because it cannot be explained from the classical or the resonance theory's point of view.

The purpose of this paper is the determination of the magnitude of the electronic gap of uracil derivatives and the comparative analysis of these magnitudes with the delocalization indexes HOMA obtained in our previous work [2].

In this regard five calculations for different uracil derivatives were performed. Quantum-chemical calculations were carried out using the Gaussian09 Rev.D⁸ software package. All the structures of interest were optimized and the frequency calculations were performed within the density functional theory in approximation of τ -dependent gradientcorrected functional TPSSTPSS. The basis set of triple valence splitting, augmented with *d*- and *p*-type polarization functions and with a set of diffuse functions, 6-311+G(d,p) was used. All the structures presented correspond to the minima on the potential energy surface. The latter fact was confirmed by obtaining a set of only positive vibration frequencies in Hessian calculations.

Both specific and nonspecific salvations were taken into account. The specific salvation model has the following distinctive feature: to account the specific interactions with the solvent around the studied molecule the primary solvent layer consisting of five water molecules was reviewed. Non-specific solvation was taken into account using the SMD model.

To evaluate the magnitudes of energetic gaps, the analysis of molecule orbitals was performed using the NBO method on the same theory level. HOMO-LUMO gap was represented by the energy gap between the Highest Occupied Molecular Orbital (HOMO) and the Lowest Unoccupied Molecular Orbital (LUMO). In Table 1 the HO-MO-LUMO energies evaluated using the TPSS/6-311+G(d, p) are shown.

⁸Calculations were performed on the cluster supercomputer "Enterprise" of Institute of Petroleum Refining and Petrochemistry

Name	E _{HOMO} , eV	E _{LUMO} , eV	E _{HOMO-LUMO} , eV
5BrU	-5,97	-2,27	3,70
5ClU	-6,02	-2,26	3,75
5FU	-6,03	-2,21	3,82
5CH ₃ U	-5,91	-1,97	3,94
6CH ₃ U	-6,08	-1,94	4,14

Table 1. The HOMO-LUMO energies of uracil derivatives

Figure 1 shows the median scale of the correlation between the magnitude of the energetic gap of boundaring orbitals HOMO-LUMO and the magnitude of delocalization indexes HOMA with R^2 =0.98.

Figure 1. The correlation between $E_{(HOMO-LUMO)}$ and the magnitude of delocalization indexes of uracil derivatives



Thus, from the correlation received we can assume that the magnitude of the energetic gap of boundaring orbitals can be used further as a characteristic of the coupling of the pyrimidine systems.

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Biodegradable polymers on the basis of lactic acid (Биоразлагаемые полимеры на основе молочной кислоты)

Biodegradable polymers are an increasingly well known alternative to petroleum based plastics because they are derived from biological sources instead of petroleum based feed stock.

Polylactic acid (PLA) is one of the most promising biodegradable polymers. The monomer – lactic acid (2-hydroxy propionic acid) can be produced by microorganisms.

PLA is a colorless, glossy, stiff thermoplastic polymer with properties similar to polystyrene. PLA has numerous advantages over synthetic polymers such as:

• It is produced from renewable resources,

• It permits considerable energy savings,

• It can be recycled back to lactic acid which is a non-toxic and naturally occurring metabolite through hydrolysis or alcoholysis,

- It is compostable,
- It can improve farm economics,
- It can decline disposing ranges
- It is degraded by microorganisms within months.

There are two major routes to produce polylactic acid from the lactic acid monomer:

• direct condensation polymerization of lactic acid

• ring-opening polymerization through the lactide intermediate.

The first route involves the removal of water by condensation and the use of solvent under high vacuum and temperature. With the help of this route only low- to medium-molecular-weight polymers can be produced, mainly because of the presence of water and impurities. Other disadvantages of this route are the relatively large reactor required, and the need for evaporation, recovery of the solvent and increased color and racemization. The second route – ring-opening polymerization through the lactide intermediate. In the first step of the process water is removed under mild conditions (and without the use of a solvent) to produce a low molecular weight prepolymer. This prepolymer is then catalytically depolymerised to form a cyclic intermediate dimer (lactide), which is then purified to polymer grade using distillation. The purified lactide is polymerized in a solvent free ring-opening polymerization and processed into polylactide pellets. By controlling the purity of lactide it is possible to produce a wide range of molecular weights.

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The electrical conductivity of composites of polyolefins with carbon black and carbon fibers (Электропроводимость композитов полиолефинов с техническим углеродом и углеродными волокнами)

In modern technology, there are problems, such as lowtemperature electric heating, shielding of electronic equipment and sensor designs, static pressure measurement and so on, which can be solved by the use of polymeric composite materials (PCM). As the filler, generally various metal powders are used, including noble metal, carbon powders, insulating powders with a conductive coating. Exotic fillers can also be used, for example, carbon nanotubes.

Electrically-conductive carbon fillers included in a polymeric matrix are capable of providing a significant reduction of electrical resistance of the composite material as compared to the initial resistance of the polymer. The introduction of carbon black (CB) into the polymer composition results in a dramatic increase in conductivity.

On the basis of experimental data, it was established that the composition of the ABS-filled CB brands P805E and P803 show almost

similar conductivity values: with the same content of carbon 50-60% the electrical conductivity of the polymer material makes up 0.6 mm×Ohm²/cm. Absolutely different results are observed if carbon black «Printex XE-2B» is used as a conductive filler: if the content of «Printex XE-2B» is 15 % the conductivity of a polymerc material is - 0.77 mm×Ohm²/ cm.

Significant differences in the electrical conductivity of filled polymers are explained by different size and shape of carbon black particles introduced into the polymer matrix. In this regard, the effect of fineness and distribution of the carbon blacks was studied. It was found that the used marks of CB considerably differ in fineness and particle size. The electrically conductive carbon blacks can be characterized by liquid absorption of dibutylphthalate (DBP): carbon black Printex XE-2B absorbs 410 cm³/ 100g, whereas carbon black marked P803 and P805E absorbs 97-110 cm³/ 100g DBP. Thus, carbon black Printex XE-2B is characterized by a high degree of granularity and significantly smaller particle size as compared to carbon black P803 P805E. It perhaps explains the low threshold of electrical conductivity of polymeric composites on the basis of CB Printex XE-2B.

Thus, ABS filled with carbon black of such grades as P805 and P803, show almost identical dependence of the electrical conductivity on the polymer content. When using highly structured carbon blacks Printex XE-2B electrical resistivity value of 6.3 mm×Ohm²/cm is achieved at a degree of filling about 15%, while the conductivity value similar to the case of using P803, P805E is achieved at a degree of filling about 70%.

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Kinetics of oxidation of polyvinyl alcohol by ozone-oxygen mixture at the initial stage (Изучение кинетики окисления поливинилового спирта озон-кислородной смесью на начальной стадии)

Polyvinyl alcohol (PVA) relates to a small number of synthetic water-soluble polymers. This important property allowed us to use it in different areas of the industry. PVA used for production of various emulsions, thickeners, adhesives, stabilizers, water-soluble films. An important role is given to the polyvinyl alcohol in medicine, because it is the main component in the manufacture of surgery, water-soluble membranes for medical products, lubricant for eye drops and lenses. Also the use of this polymer seems promising for treatment as matrix for drugs with prolonged action.

The kinetics of the reaction of polyvinyl alcohol by ozoneoxygen mixture was studied spectrophotometrically. Experiments carried out at $6 \div 32^{\circ}$ C. Choice of low temperatures is determined by the necessity of studying the initial stage of PVA oxidation. The concentration of products in the reaction mixture will be insignificant and their effects on the oxidation process can be neglected. The initial concentration of PVA was changed in the range of $10^{-3} \div 10^{-2}$ mol / 1 (per one structural unit); in these conditions [PVA]₀ >> [O₃]₀.

It was determined that the kinetic curves of absorbance change in well linearized equations coordinates $nA = lnA_0 - k't$, indicating the first order reaction by ozone: $-\frac{d[O_3]}{dt} = k'[O_3]$, where k '- effective first-order rate constant of the reaction.

It was found that the effective rate constants k' are directly proportional to the initial concentrations of PVA ($k' = k[\Pi B C]_0$), indicating the first-order reaction with respect to the substrate.

Thus, the ozone consumption rate in the reaction with the polyvinyl alcohol is described by the following kinetic equation: $-\frac{d[O_3]}{dt} = k[\Pi BC][O_3]$, where k - rate constant of second order reaction. The values of k are found from linear dependencies of k ' from the $[PVA]_0$.

Table 1

The temperature dependence of the rate constants k in the reaction of polyvinyl alcohol with ozone

poryvinyr alconor with ozone				
T, °C	$k \cdot 10^{-2}$, l/mol·min			
6	0.1 ± 0.01			
12	0.19 ± 0.04			
17	0.25 ± 0.03			
22	0.50 ± 0.05			
27	0.12 ± 0.07			
32	1.17 ± 0.13			

In this study, we investigated the temperature dependence of the rate constant k (Table 1.), where the estimated values of the activation parameters were obtained: $\lg A = 17 \pm 2$; $E = 87 \pm 8$ kJ / mol.

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Complex formation of pectin with some drugs (Комплексообразование пектина с некоторыми лекарствами)

The decrease in efficiency of treatment by drugs connected with resistance of microorganisms has been observed recently. The solution of this problem can be using polymeric derivatives in which a medicinal substance - an antibiotic is in a complex connected with a polymeric matrix. Investigation of a complex formation of pectin with antibiotics amikacin (AM) and cefazolin (CFZ) which are widely applied in medical practice became the purpose of this work.

The complex formation of pectin with AM and CFZ was studied by method of UV-spectrophotometry. At additing pectin in water solution AM and CFZ the intensity of strips of absorption of drugs changes and slightly moves to the long-wave area that testifies to formation of a complex pectin - medicinal substance.

The composition of the received complexes was determined by methods of isomolar series and the molar relations. For adduct of pectin-AM it was equal 4:1 and of pectin-CFZ - 1:1. The constants of stability calculated by these methods have shown that complexes of average stability are formed.

Thermodynamic characteristics of reaction are important for clarification of the mechanism of interaction of pectin with AM and CFZ. The calculated values being ΔH and $\Delta G < 0$, the process of interaction proceeds spontaneously, it accompanied by allocation of heat and proceeds in the direction of formation of products of reaction. From the values of change of reaction enthalpy it follows that the strongest communication is between pectin and CFZ that correlates with values of constants of stability. Besides, for adduct pectin-AM $\Delta S > 0$ that testifies that process proceeds in the direction of increase in system disorder (and daily experience shows that it is the most probable process). In case of adduct pectin-CFZ $\Delta S < 0$ that is probably connected with considerable ordering as a result of the organization of molecules of pectin and CFZ in the adduct.

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Oxalate oxidase role in induction of resistance of wheat plants to septoriose caused by endophytic bacteria of *Bacillus* genus (Роль оксалатоксидазы в индукции устойчивости растений пшеницы к септориозу бактериями рода poдa Bacillus)

There are plenty biochemicals in agricultural practice but biochemical endophytic bacteria processes of plants have not been investigated well enough yet. They can be traced with pathogenic microorganisms.

Such interference causes a wide range of immunity reactions which are targeted at trophic vermin isolation and destruction.

The aim of my work is to investigate bacteria and plant oxalate oxidases in processes of generation peroxide and formation of induced stability by bacteria strains *B. subtilis 26D, B. thuringiensis 10 and 11* of wheat sort «Kazakstanskaja» to pathogenic fungi *Septoria nodorum DC Berk.*

The influence of preliminary plant treatment with *B. subtilis 26D* spores for wheat septorious resistance

Plant treatment with bacteria spores suspension promoted lesser progress of plant illness





A) Infected control sample

B) B.subtilis 26D



C) B. thuringenesis 10

D) B. thuringenesis 11

Table 1.

Leaf damage degree					
	Damage degree in	Damaged to com-			
Sample	points	mon leaf correla-			
	(10 points scale)	tion, mm ²			
Control	10	0,5			
Bacillus subtilis 26 D	3	0,14			
Bacillus thuringenesis 10	4	0,22			
Bacillus thuringenesis 11	7	0,38			
-					

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Voltammetric "electronic tongue" for identification of insulinic medicines (Вольтамперометрический «электронный язык» для идентификации инсулиновых препаратов)

Due to the increasing requirements to the quality of medicines, the use of modern standardized methods for their analysis is of vital importance. Along with the use of chromatographic and optical methods for the detection of organic compounds, electrochemical analysis methods are commonly used, voltammetry in particular.

In recent years, the development and practical application of chemically modified electrodes has become relevant. Sensors based on these electrodes are used for the detection of a large number of different substances, particularly medicinal compounds. To modify various chemical compounds, polymer films are applied to the surface of the electrode material. They significantly change the ability of the electrode to the voltammetric response. Such modified electrodes are often used in multisensory systems of the "electronic tongue" - type.

A new three-electrode multisensory system was proposed for voltammetric analysis of insulinic medicines with the use of three polyarylenephthalides as modifiers (TO, TOO, TOOO). The use of the three different modifiers provides the cross-sensitivity condition of the electrodes required for the functioning of the voltammetric systems of the "electronic tongue" - type.

In this work different pharmaceutical formulations of insulin (Lantus SoloStar, Biosulin R, Apidra SoloStar, Novorapid FlexPen, Novorapid Penfill, Levemir FlexPen) were investigated by voltammetric method. Processing of the obtained voltammograms of insulinic medicines was carried out with the use of chemometric methods: the method of principal components analysis (PCA) and the method of soft independent modeling of class analogy (SIMCA).

The use of polyarylenephthalides as modifiers provides a clear separation of the response signals of insulinic medicines on the plot of PCA-modeling. SIMCA- classification showed that the proportion of correctly identified insulinic medicines equaled 100%.

Thus, express-identification of medicines with the use of the voltammetric "electronic tongue" can be carried out with high accuracy.

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Structural and thermal stabilization of PVC and WOOD/PVC composites (Структурная и термическая стабилизация ПВХ и древесных композитов / ПВХ)

Polyvinyl chloride (PVC) is one of the most successful modern synthetic materials, but its serious disadvantage is its low thermal stability. This obstacle has been overcome by incorporation of stabilizing agents mostly with the content of heavy metals. Numerous studies on PVC degradation and stability showed that the reason for such poor thermal stability originated from polymerization process. It can be concluded that PVC upgrade by modification of the processes on water–polymer surface have a potential to obtain more stable PVC. A complementary way for achieving this goal is the protection of PVC chains from hydrogen abstraction by complexation with different compounds. Compounds from the family of additives used in PVC compounding are of special interest as an alternative from not only a scientific, but also an economic point of view.

Structural and thermal stabilizations of PVC and wood/PVC (WPVC) composites were studied with the use of lead stearate (PbSt2), calcium/zinc complex (Ca/Zn) as stabilizers and methyl tin mercaptide. Thermal and structural stabilities of PVC and WPVC composites were assessed with the use of FTIR spectrometer, thermogravimetric analysis (TGA) and UV-Vis spectrophotometry.

The results indicated that addition of thermal stabilizers into PVC and WPVC composites could promote thermal stability under both under unoxidized and thermal-oxidezed conditions. The presence of wood particles resulted in the increase in polyene and carbonyl sequences during processing and decrease in the decomposition temperature (Td). The presence of wood was found to accelerate the thermal degradation in PVC and suppress the efficiency of the thermal stabilizers that were used. By the increase of the stabilizer dosage thermal degradation of PVC and WPVC was inhibited. Under thermal-oxidezed condition at 177oC, the thermal stabilizer addition could reduce the increase in yellowness index (YI) and discoloration at different ageing times. In this investigation MT was found to be the most suitable and promising stabilizer for PVC and WPVC composites, considering the polyene and carbonyl contents, Td, the shift of derivative thermogravimetric (DTG) curves and changes in YI value and visual color.

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Specific features of the rheological behavior of carboxymethyl cellulose sodium salt solutions (Особенности реологического поведения растворов натриевой соли карбоксиметилцеллюлозы)

As is known, the rheological behavior of polyelectrolyte solutions has some peculiarities unlike that of solutions of nonionic polymers. The manifestation of the mentioned peculiarities is strongly dependent on the concentration region in which the polymer resides. For example, in the region of semidilute solutions, the rheological behaviors of nonionic and ionic polymers are similar: macromolecular coils are not overlapped and move independently of one another. Once the critical concentration (crossover concentration c^*) characterized by the complete filling of solution by polymer coils is achieved, the differences between polyelectrolyte and nonionic polymer solutions begin to emerge. In solutions of uncharged polymers just above crossover concentration c^* at the polymer concentration in a solution of c_e , the intermolecular association and formation of the fluctuation network begin. Thus, in a solution of nonionic polymers, the fluctuation network is formed immediately once the crossover point is attained: $c^* \sim c_e$ Polyelectrolyte solutions are characterized by the presence of an extended region of semidilute solutions in which the coils come in contact with one another, but the fluctuation network is yet not formed. The mentioned peculiarity of the rheological behavior of polyelectrolytes is related to the electrostatic repulsion of similarly charged chains, which hinders the interpenetration of coils and the fluctuation- network formation.

The aim of the research was to extend the range of polyelectrolytes for which the characteristic features of rheological behavior were detected. The object of the study was sodium carboxymethyl cellulose (CMC) with aqua as a solvent.

The rheological study of CMC solutions was performed on the Haake Mars III module dynamic rheometer at 25° C under continuous shear deformation in the range of shear rates $0.1-100s^{-1}$. The crossover concentration of the CMC sample was 0.03 g / dL.

The experiment showed that on the initial plot of concentration, when $c < c^*$, the viscosity of the CMC solutions was $\eta \sim c^n$, where n=1. With the increase of the polyelectrolyte concentration the macromolecules began interacting with each other which resulted in the viscosity increase and $\eta \sim c^n$, where n>1. With further increase of concentration up to $c_e = 0.1$ the fluctuation network was formed. It was shown by a distinctive kink on the viscosity - concentration curve in double logarithmic coordinates.

Thus, it is shown that $c^* \neq c_e$ for carboxymethyl cellulose solutions as in case of chitosan solutions.

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The structural isomers of bis- and mixed-ligand amino acid complexes of Co (II) (Структурные изомеры бис- и разнолигандных аминокислотных комплексов Co(II))

It is known that the compounds Co (II) with bidentate NOligands are stable octahedral complexes [1]. However, determining the composition and structure of forming geometrical isomers at that process is a difficult task.

In order to study structural isomers of amino acid Co(II) complexes with bis-chelate ligands were obtained the complexes with gly (1,4), S-ala (2) and R, S-val (3), they were based on the method [2]; and we synthesized also complexes with gly (1,4 ') according to the method described in literature [3].

Complexes were investigated by the IR spectroscopy on Fourier spectrometer FTIR-8400S (Shimadzu) in the range of 800-4000 cm-1 (Table).

Table

	Evit	The absorption bands of the functional groups (cm-1)			
Compound	<u>Елі</u> , %	v _{as} (COO ⁻)	v _s (COO ⁻)	v(-CH,CH ₃)	$v_{s,as}(-NH_2)$
glycine (glyH)	-	1608	1412	2923	3125; 3180
valine (<i>R</i> , <i>S</i> -valH)	-	1595	1418	2961	3126
alanine ((S)-alaH)	-	1593	1410	2854; 2924	3078
[Co(gly) ₂ (H ₂ O) ₂] (1) [2]	76	1608 1603	1391; 1387; 1359	2925; 2916; 2852; 2849	3213; 3308; 3300; 3255
$Co(gly)_2(H_2O)_2]$ (1) [3]	22	1610; 1600	1392	2926; 2934	3267; 3272

IR-characteristics of the complexes 1-4 and 1,4'

[Co(<i>S</i> - ala) ₂ (H ₂ O) ₂] (2)	95	1653 1647	1393 1387	2926; 2919; 2858; 2852	3267; 3259; 3236
[Co(<i>R</i> , <i>S</i> - val) ₂ (H ₂ O) ₂] (3)	99	1647; 1616; 1651	1393; 1381	2972 2961	3132 3137
[Co(gly) ₃] (4) [2]	35	1645; 1611	1395; 1381;1358	2968 2979	3134 3238
[Co(gly) ₃] (4') [3]	23	1615; 1601	1393; 1372	2926: 2915	3228; 3236

It is established that the complexes are formed as structural isomers of octahedral shape, which corresponds to literature data [4].

It is shown that depending on pH different structural isomers of complexes 4 and 4 ' are formed, while such dependence for the complexes 1 was not found in the reaction (Table).

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Complex formation of cyclodextrin (Комплексообразование циклодекстрина)

Cyclodextrins are a family of cyclic oligosaccharides with a hydrophilic outer surface and a lipophilic central cavity. Cyclodextrin molecules are relatively large with a number of hydrogen donors and acceptors. Thus, in general they do not permeate lipophilic membranes. Cyclodextrins are widely used as "molecular cages" in the pharmaceutical, agrochemical, food and cosmetic industries. In the pharmaceutical industry they are used as complexing agents to increase the aqueous solubility of poorly soluble drugs and to increase their bioavailability, safety and stability. In addition, cyclodextrins can be used to reduce gastrointestinal drug irritation, convert liquid drugs into microcrystal-line or amorphous powder, and prevent drug–drug and drug–excipient interactions.

In aqueous solutions, cyclodextrins are able to form inclusion complexes with many drugs by taking up the drug molecule or some lipophilic moiety of the molecule, into the central cavity. No covalent bonds are formed or broken during complex formation, and the drug molecules in complex are in rapid equilibrium with free molecules in the solution. The driving forces for the complex formation include release of enthalpy-rich water molecules from the cavity, hydrogen bonding, Vander Waals interaction, charge transfer interaction etc. The physicochemical properties of free cyclodextrin molecule differ from those in complex. The stoichiometry of the complexes formed and the numerical value of their stability constants can be determined by observing the changes in physicochemical properties like solubility, chemical reactivity, UV/VIS absorbance, drug retention, chemical stability, effects on drug permeability through artificial membranes etc [1]. The formation of the inclusion complex between aminosalicylic acid and β cvclodextrin has been studied and the stoichiometry of the complexes was found to be 1mol of aminosalicylic acid: 1 mol of cyclodextrin. The constant stability value (Ks) was higher for 4-aminosalicylic acid: βcvclodextrin than for 5-aminosalicylic acid: B-cvclodextrin inclusion complexes.

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Studying the influence of some drugs on the process of enzyme hydrolysis of chitozan in the solution of acetic acid (Исследование влияния некоторых лекарственных препаратов на процесс ферментативного гидролиза хитозана в растворе уксусной кислоты)

Nowadays one of the perspective directions of the use of chitosan (ChT) is the creation of the film materials on its basis including drugs for the treatment of surgical, burnt and sore wounds. In the conditions of medical application of chitosan materials their biodestruction is carried out under the influence of nonspecific enzymes of a human body (for example, hyaluronidase) and defines covering service life on a wound surface. In the works of previous years we defined some kinetic characteristics of the activity of enzyme hyaluronidase for the reaction of enzyme hydrolysis of ChT in the solution of 1% acetic acid [1], and also in the presence of antibiotics of an aminoglycoside series amikacin [2, 3] and gentamycin [4]. This work is undertaken with the purpose of the expansion of some medical substances (MS) immobilized in a polymeric matrix. The following objects were used in our research: they were ChT (M_{sn}=113000), antibiotics of cephalosporin series - sodium salt of cefazolin (CFZ) and cefatoksim (CFT), an enzyme preparation hyaluronidase. The concentration of enzyme preparation was 0.1 g/l. 1% acetic acid was used as some solvent for ChT. The concentration of ChT in the solution for carrying out the process of enzyme hydrolysis varied from 0.1 to 5 g/dl. Kinetic constants of the process of enzyme hydrolysis were defined according to the method described in the works [1-4] at molar ratios of ChT: MS. It was equal to 1:0.01 and 1:0.1. The conducted researches showed that the observed dependences of an initial rate of enzyme hydrolysis of ChT in the presence of CFZ and CFT on concentration of a substratum (ChT) can be described within the scheme of Mikhaelisa-Menten, as well as in case of enzyme hydrolysis of ChT with the lack of drugs [1]. The received values of K_m for the systems of ChT: CFZ and ChT: CFT testify that the affinity of ChT to enzyme in the presence of antibiotics worsens. Besides the reduction values of V_{max}/K_m in the systems of ChT-MS in comparison with an individual ChT shows that drugs systems are more steady to biodegradation processes. Thus, according to the influence of CFZ and CFT on the process of enzyme hydrolysis of ChT, antibiotics of a cephalosporin series, practically don't differ from the antibiotics of an aminoglycoside series which had been researched earlier. It is obviously connected with the fact that all of them represent low-molecular electrolytes.

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Dispersed elements of molecular sulfur in Na₂S₂O₃ complex with dibasic acids (Динамика образования дисперсных частиц молекулярной серы в реакции Na₂S₂O₃ с двухосновными кислотами)

At the present time the use of nanoparticles and nanomaterials is in progress in many sectors of human life. Nanoscale molecular sulfur S_8 is widely used for many years in medicine, agriculture and other areas of national economy.

It is known that the rate of a reaction and S_8 grow are up by increasing of reactants concentration.

There was investigated formation dynamics of dispersed elements of S_8 in $Na_2S_2O_3$ complex in reaction with amber and tartaric colour

acids depending on their concentration. The dimension of formed elements was measured by the laser analyzer SALD-7071 (Shimadzu).

Results of the study $Na_2S_2O_3$ with dibasic acids are presented in Figures 1 and 2.





It was found that the area of solutions interaction of $Na_2S_2O_3$ of low concentration is not stable: this period is characterized by the nonlinear changes (fig.1 and 2) and includes at least three periods. Thus, the variation by the solutions' concentration of the reaction components, in particular, $Na_2S_2O_3$ and amber acids determines the optimal solutions' concentration for obtaining S_8 elements of a given size.

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Chemical sensors based on nanopolymeric pellicle (Химические сенсоры на основе нанополимерных плёнок)

Special attention to the organic materials is determined by a broad range of existing and synthesized at present time organic compounds which are used as materials in the modern electronic engineering. A significant improvement of operational performance and effectiveness of organic electronic devices draws more attention and opens the way for practical its application in the last decade. Nanostructured polymeric materials which allow achieving totally new physical properties are of the key interest.

A perspective object of assumed applications is a new class of unconjugated polymers: Polyarylenephtalides.

Therefore, the purpose of this work is the methodology development of creating nanostructured bimeric polymeric material, its practical implementation based on Polyarylenephtalides, research on its electrophysical properties and analysis of ways of its application. In the course of carrying out the methodology a unique technology of producing a nanosized self-organizing transport layer on the boundaries of division of two polymer films was elaborated. High longitudinal conductivity, well-managed by external influences has been implemented in this structure.

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The first example of the Zr-catalyzed carboalumination of 1-alkinyl sulfides with Me₃Al (Первый пример Zr-катализируемого карбоалюминирования 1-алкинилсульфидов с Me₃Al)

Alkenyl sulfides play an important role in the synthesis of biologically active compounds. Despite the fact that there are many approaches to the preparation of alkenyl sulfides, stereoselective synthesis of *E*- and *Z*- isomers is still an urgent problem. We have found that Cp_2ZrCl_2 catalyzed methylalumination of 1-alkynyl sulfides with 3 equivalents Me₃Al in dichloromethane at room temperature for 18 h yielded β , β substituted alkenyl sulfides **1a-c** in high yield after deuterolysis or hydrolysis. Methylalumination of triple carbon-carbon bond proceeds in a highly regio- and stereoselective manner. The structure of the products was established by one- and two-dimensional NMR spectroscopy. Thus, we carried out Zr-catalyzed methylalumination of 1-alkynyl sulfides with Me₃Al.

$$R \longrightarrow SR' \xrightarrow{Me_3Al (3 \text{ 3 KB.})}_{CH_2Cl_2, \text{ rt, 18h}} \left[\begin{array}{c} R \\ Me \end{array} \xrightarrow{SR'}_{AlMe_2} \right] \xrightarrow{D_2O(H_2O)} \begin{array}{c} R \\ Me \end{array} \xrightarrow{SR'}_{Me} \xrightarrow{SR'}_{D(H)}$$

$$1a: R = n-Hex, (82\%),$$

$$1b: R = n-Oct, (87\%),$$

$$1c: R = Ph, (89\%),$$

$$R' = Me$$

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What can be added to PVC? (Что добавить к ПВХ?)

Polyvinylchloride (PVC), ranking the second by popularity among polymers, captured the headlines due to not only its own characteristics but also additives included in PVC composites that improve processing properties and overall product quality. The PVC products are not processed in pure form but in admixture with additives. PVC composition is traditionally defined based on 100 weight parts of polymer. Therefore, for example, 6 weight parts of filler equal to 5 percent of the whole mixture mass. The main disadvantage of PVC is its low thermal stability, so one of the main PVC components is heat stabilizer. It allows to process PVC at the temperatures above 140°C at which degradation of the polymer begins. Apart from effective and proper stabilization, a properly chosen lubricant intended to reduce friction between the particles during processing (e.g., calcium stearate) is important. Plasticizers are used to make polymers, particularly fragile ones soft and flexible. PVC compositions containing a plasticizer (usually 40-60 weight parts), referred to as "soft" or plasticized. In Russia dioctylphthalate is mainly used as a plasticizer. Phenolic antioxidants such as diphenylolpropane act as light stabilizers and prevent oxidation of plasticizers. Other components of the formulation, which sometimes require special stabilization are fillers and pigments. Fillers cheapen the composition, but they reduce the tensile strength, elasticity, resistance to abrasion.

PVC is widely used in many areas of human life: in medicine, transportation, construction, consumer products from toys to packaging, etc.

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Printed circuit heating elements prototypes based carbon-filled conductive PVA compositions (Печатные прототипы нагревательных элементов на основе угленаполненных электропроводящих ПВА-композиций)

Printed prototypes of circuit heating elements are based on carbon-filled conductive PVA compositions.

First introduced as a tool for visualization and prototyping, 3D printing is used in the modern world in a fundamentally different spheres of life. Expansion of the use of three-dimensional prototypes is primarily associated with the materials used for printing, as well as the physical and mechanical characteristics of the final prototypes. 3D printing technology development involves three-dimensional prototyping of conductive objects that can significantly extend the scope of the resulting materials and improve their processing properties.

The aim of this work is to obtain prototypes of conductive heating elements based on carbon-filled PVA compositions.

The electrically conductive polymer compositions based on PVA TU Printex XE2B can be used for three-dimensional prototyping of passive electrical systems and components. As prototypes using 3D printing electrical circuits elements are created, e.g. electric heating elements. So, using the three-dimensional prototyping systems based on PVA compositions with carbon black content of 10 wt. % heating elementsare designed.

The characteristics of the heating elements are as follows:

the geometric dimensions of the heating elements: variable;

Power of heating elements: 0.1 kW

Supply voltage: 220 V AC, 250 V DC.

The three-dimensional prototyping of heating elements of any geometrical shape opens up opportunities for the use of the developed components in various fields of technology. Heating elements based on carbon-filled compositions may find use in experimental settings of organic synthesis, microheatingsystems and others. Thus, using the 3D printer UniqBot of «Maximus 1.2»modification demonstrates the possibility of obtaining threedimensional prototype of conductive heating elements on the basis of the carbon-filled PVA compositions with the resistance from 1 to Ohm. © Николаев Алексей, 2016

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Synthesized new 2- and 3-methoxyderivatives quinopimaric acid by Diels-Alder reaction of levopimaric acid with 2-methoxy-1,4benzoquinone (Синтез новых 2- and 3-метоксипроизводных хинопимаровой кислоты реакцией Дильса-Альдера левопимаровой кислоты с 2-метокси-1,4-бензохиноном)

Found that the Diels-Alder reaction of levopimaric acid with 2methyl-1,4-benzoquinone under catalysis proceeds $BmimBF_4$ acceleration by two orders of magnitude and increase in regioselectivity. *Novel compounds were characterized on the basis of elemental analysis and NMR spectroscopy.*

Resin acids produced by Russian pine, are readily available compounds and may serve as a basis for the design and synthesis of new pharmacologically perspective molecules. in recent years there has been a steady increase in the number of publications devoted to the synthesis of diene adducts of resin acids. Among the adducts of diene synthesis of levopimaric acid with quinones there were found compounds with antitumor, anti-inflammatory, anti-ulcer and anti-viral activity [1]. The diene synthesis reaction of levopimaric acid and 2-methoxy-1,4benzoquinone is of considerable interest for a search for new potential biological activity of the optically active substances.

Diene synthesis takes place at room temperature in methylene chloride-hexane (95:5) for 7 days. The reaction yields a mixture of regioisomers 2a, b in a ratio of 7: 1, with a predominance of 3-

metoxyquinopimaric acid 2a. Addition of catalytic amounts of an ionic liquid (BmimBF4) to the reaction significantly accelerates the rate of reaction (1 h) and, in contrast to all previously synthesized quinopimaric acid derivatives [2] cycloaddition regioselectivity increases to a ratio of 95: $5 \pm 2\%$. The ratio of regioisomers is determined by the integrated intensity of the proton signals at 14C in the 1H NMR spectrum.



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Synthesis of fullerene derivatives on the basis of esters of dodecyl and arachidic alcohols (Синтез производных фуллерена на основе эфиров додецилового и арахинового спиртов)

Energy is currently one of the most important problems that humankind faces. Depletion of traditional energy sources such as coal and oil results in the need to develop new ways to create, transport, and store electricity. In this regard, the sun represents the most powerful source of energy available in our solar system. Organic photovoltaic cells, developed in the past two decades, have a potential as an alternative to traditional inorganic semiconductor photovoltaic cells, which pollute the environment and require high energy consumption in the production process. Organic photovoltaic cells are composed of a blended film of a conjugated-polymer donor and a soluble fullerenederivative acceptor.

Functionalized fullerenes are of interest as electron acceptor materials in bulk-type converters of solar energy into electricity. In these devices, light absorption and charge separation occurs in the binary polymer films with a donor and an acceptor fullerene. The amplification of the interfacial contact between the donor and acceptor has a clearly positive effect on the light conversion efficiency.

Functionalized fullerenes have "low solubility" in commonly

used solvents, which limits greatly their application. Our aim was to obtain fullerene-containing compounds, that include lipophilic and lipophobic parts. We conducted the synthesis of compounds 1 and 2 on



the classical Bingöl-Hirsch scheme by cyclopropanation of C60 by CHacids, obtained by acylation of dodecyl and arachidic alcohols with the use of anhydrides of dichloroacetic acid. The cyclopropanation reaction of C60 with equimolar amounts of reactants was carried out for 8 hours, resulting in yields of over 50% of methanofullerenes 1 and 2.

Arachidic alcohol was formed by arachidonic acid ester hydrogenation by LiAlH4.

The structure of the synthesized compounds was proved by ¹H NMR, ¹³C, mass spectrometry. The methanofullerenes obtained contain long alkyl side chains associated with the fullerene core by an articulated cyclopropylcarboxylate subunit. The presented structure provides the molecules amphiphility (lipophilic alkanoic part and lipophobic fullerene "head") and increases the solubility of the synthesized methanofullerenes in typical organic solvents.

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Synthese von poly-2-[(1s)-cyclopent-2-en-1-yl]anilin (Синтез поли-2-[(1s)-циклопент-2-ен-1-ил]анилина)

Heutzutage wächst das Interesse an die Klasse von elektrisch leitfähigen Polymeren wie z. b. Polyanilin, Polypyrrol und ihre Derivate. Als anorganische Halbleiter können Polymere in verschiedenen Zuständen der Oxidation auf die Außenwirkung reagieren. Sie können also ihre Farbe, magnetische Eigenschaften, elektrische Leitfähigkeit, Dichte, Permeation gegenüber Gasen und Flüssigkeiten ändern. Aber neben den oben beschriebenen Vorteilen dieser Polymere ist einer der bedeutendsten Nachteile die sehr geringe Löslichkeit.

Das Ziel unserer Arbeit war ein lösliches elektronisch konjugiertes Polymer auf Basis von Polyanilin -Derivat zu erhalten.

Als das Monomer war 2-[(1s)-cyclopent-2-en-1-yl]anilin (1) genommen. Als das Oxidationsmittel war Ammoniumperoxodisulfat genommen. Eine der wichtigsten Voraussetzungen für die erfolgreiche Durchführung der oxidative Polymerisierung ist 1 des pH-Reaktionmediums bestimmt. Und in den Alkalischen-, Neutralen-, Säurenmedien werden die Oligomeren gebildet, die keine leitende Funktion haben. Für die Erhaltung des Produkts vom hohen Molekulargewicht gibt es die Polymerisation 1 im Medium 2,0 M HCl bei der Verwendung des Oxidationsmittels - Ammoniumperoxodisulfat. Das Verhältnis der Reagenzien war 1:1.25, wie es gilt, dass dieses Verhältnis das beste Ergebnis ist, höhere elektrische Eigenschaften hat.

Zur Lösung von **1** bis 2,0 m HCl bei der Temperatur von 0° c wird beim Rühren die oben genannte Menge Oxidationsmittel hinzugefügt. Im Laufe einer Stunde kommt die exotherme Reaktion in der Kolbe vor, die von der Veränderung der Farbe und des schwarz-grünen Ausfällens begleibet wird - Poly-2-[(1s)-cyclopent-2-en-1-yl]anilin. Die Nebenprodukte der Synthese werden durch das wiederholte Waschen des Schlamms mit dem destillierten Wasser entfernt.

Das Schema der Produktion von Poly-2-[(1s)-cyclopent-2-de-1-yl]anilin ist unten gegeben.



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New substituted phenols as oxidation inhibitors of 1,4-dioxane (Новые замещенные фенолы как ингибиторы окисления 1,4-диоксана)

Phenolic compounds are widely distributed in the plant kingdom and constitute one of the most important classes of natural and synthetic antioxidants that prevent undesirable oxidation reactions. It is known that these processes occur by radical - chain mechanism. The antioxidant activity of phenolic compounds depends on the structure, in particular on the number and positioning of the hydroxyl groups and nature of substitutions in the aromatic rings. The ortho-position was found to be more active due to its ability to form intramolecular hydrogen bonding, followed by para- and then meta positions of the compounds. Their aryloxyl radicals (ArO·) are able in most cases to trap the second ROO· radicals or to quench by themselves often with the formation of active compounds, that is n = 2 and sometimes n > 2, but they do not continue autoxidation. For all these reasons, phenols have a privileged role among the chain-breaking antioxidants.

I have studied the effect of three substituted phenols (substituents in the 2,4,6 positioning) on the oxidation of 1,4-dioxane. The oxidation of 1,4-dioxane was performed at 75 $^{\circ}$ C in the presence of a classical

oxidation initiator, which is 2, 2' - Azodiisobutyronitrile (AIBN). The kinetics of the reaction was monitored by the absorption spectra in the short-wave spectral region.

For each of the phenol derivatives a linear dependence was set between the optical density value and concentration of the added substituted phenol, which allowed to calculate the molar coefficients of extinction. The molar coefficient of extinction (ε) is a measure of how strong a molecule absorbs light at a specific wavelength.

In the kinetic mode we investigated the effects of the substituted phenols oxidation on the initiated oxidation of 1,4-dioxane. The kinetic curves of the phenols consumption straightened in the coordinates of the first-order reaction that allowed the calculation of the phenols specific consumption rate which in its turn made it possible to determine the rate constant of peroxyl radicals reaction of 1,4-dioxane with a molecule of substituted phenol.

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Die Modifikation 1,2-Polybutadiens von den Dicyclopropangruppen (Модификация 1,2-полибутадиена дихлорциклопропановыми группами)

Eines der Hauptprobleme in der Chemie und der Technologie der Polymere ist das Erhalten neuer Hochmolekularverbindungen mittels der chemischen oder physischen Modifikation von schon existierenden Polymeren zwecks der Bildung auf ihrer Grundlage der neuen Materialien mit dem Komplex der wertvollen Eigenschaften. Die praktische Bedeutung hat die Modifikation der Polymere, bei deren die nützlichen Eigenschaften entstehen und die Stoffe verbessert werden oder die unerwünschten Eigenschaften entfernt werden. In solchen Hoch-molekularverbindungen gibt es Makroketten, die in der Struktur ungesättigt sind. Die Aktivität der Doppelbindungen lässt sich viele Reagenzien in die polymere Kette die funktionalen Gruppen verschiedenen Typs einzuführen. Polybutadien ist dank dem Vorhandensein von reaktionsfähigen Makromolekülen mit C-C-Verbindung ein bequemes Objekt für die Verwirklichung der chemischen Modifikation. Es ist bekannt, dass die chlorhaltigen Polymere über den Komplex der wertvollen Eigenschaften wie die Öl-, Benzin-, die Feuerfestigkeit, die hohe Adhäsion zu den Metallen verfügen. Deshalb stellt die Synthese neuer chlorhaltigen Polymeren auf der Grundlage 1,2-PBs das wissenschaftliche und praktische Interesse vor.

Das Ziel unserer Arbeit war die Herstellung und die Forschung der Eigenschaften der Dichlorcyclopropanpolymere auf der Basis niedermolekularen 1,2-PBs, sowie die Nutzungsmöglichkeit in den PVC-Kompositionen. Für die Modifikation war niedermolekulares Polybutadien der Marken SKD CH mit dem Inhalt der 1.2-Glieder 61 % verwendet. Dichlorcyclopropanierung des 1,2-PBs wurde mittels des Dichlorcarbens verwirklicht, des bei der Reaktion gebildeten Chloroforms mit der Wasserlösung von Natrium-Hydroxid in Anwesenheit des Katalysators in situ zur Doppelbindung Polydiens mit dem Erhalten Gem-dichlorcyclopropan Polymers. 1,2-Polybutadiene wurden mit dem Inhalt des Chlors bis zu 32 % abgeändert bekommen, was der Stufe der Funktionalisierung des Polymers 62 % entspricht. Die Zeit der Reaktion abwechselnd kann man dichlorcyclopropaniertes 1,2-PB mit verschiedener Stufe der Funktionalisierung bekommen. Es wurde bestimmt, dass mit der Vergrößerung der Stufe der Funktionalisierung die Tropfentemperatur abgeändertes 1,2-PBs zunimmt: so hat das Muster mit der Stufe der Funktionalisierung von 52 % die Tropfentemperatur auf 15°C grösser, als Ausgang ungeändertes 1,2-PBs.

Dicyclopropaniertes 1,2-PB wird mit der verhältnismäßig hohen thermischen Stabilität charakterisiert und kann im Bestande von den Kompositionen auf der Grundlage des Polyvinilchlorids als Modifikator verwendet werden, die verringernd die Schmelzfähigkeit und die Bedingungen der Überarbeitung des Polymers verbessern.

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The complexation of apple pectin, modified nicotinic acid with divalent copper ions (Комплексообразование яблочного пектина, модифицированного никотиновой кислотой, с ионами двухвалентной меди)

A promising direction in modern pharmacology is the use of modified analogues of bioactive natural substances and the use of combined structures. In the latter case, a crucial role is given to polysaccharides, which effectively perform the role of transport of nutrients, providing targeted delivery of the active substance to the target. Pectins in this case occupy a leading position among the polysaccharides, having a pronounced treatment-and-prophylactic, dietetic and protective properties. They contribute to the improved functioning of the gastrointestinal tract, are effective detoxifiers and radioprotectors.

The aim of the study is to investigate the interaction pharmacophorecontaining apple pectin with divalent copper cation. As a medicinal substances nicotinic acid with PP-vitamin activity was selected.

The complexation of modified nicotinic acid pectin with the divalent ions of copper has been proved by spectrophotometric methods. The composition and constant of stability have been set. Modification of pectin matrix organic pharmacophore leads to a greater stability of the metal complex by 2 orders of magnitude. Thermodynamic characteristics of reactions of formation of complex compounds have not been identified. Negative values of enthalpy allow us to relate the interaction of copper ions with the research objects to exothermic processes which spontaneously proceed toward formation of reaction products. The introduction of copper in native and pharmacophore-containing pectin leads to a reduction in intrinsic viscosity of the metal-containing complexes in 2.5-3 times. This fact may be associated with structural transformations of biopolymer's macrocopy in complexes. Sorption properties of native and pharmacophore-containing o pectin in relation to ions of copper (II) have been investigated. The optimal properties for maximum recovery of the metal have been selected. The influence of the nature of the biosorbents on the kinetics and thermodynamics of distribution of copper ions (II) in the heterophase system polysaccharide sorbent-water solution has been determined. Modification of the highmolecular sorbent by low-molecular reagent results in a significant decrease in the sorption capacity due to the additional steric strain.

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RESEARCH OF STRUCTURE OF LIGNOSULPHONATE RAW MATERIALS IN PROCESSING OF DRILLING REAGENTS BY IR-SPECTROMETRY METHOD (Исследование состава лигносульфонатного сырья в процессе получения буровых реагентов методом ИК-спектроскопии)

Lignosulphonates, used in production of drilling reagents, are the by-products received at wood pulping in cellulose production [1]. Today are known sulphatic (rarely used), sulphitic and introduced on production – neutral-sulfite pulping methods.

In this regard the aim of this research was studying structure of lignosulphonates at various manufacturers and ways of pulping by method of IR-spectrometry and comparison of their properties.

As samples were used technical water solutions of lignosulphonates of various manufacturers and methods of pulping (table).

N⁰	manufacturer	pulping methods
1	Cotlasski PPM, Ltd	sulphitic
2	Permski PPM, Ltd	neutral-sulfite
3	Solikamski PPM, Ltd	sulphatic
4	Syasski PPM, Ltd	sulphitic
5	Sokolski PPM, Ltd	sulphitic

Fable.	Samples	of tec	hnical	lignos	ulphonates

Definition of functional groups as a part of lignosulphonates of various manufacturers (samples 1,2,3,4,5) was carried out by the IR-spectrometry method. Infrared ranges (IR spectrums) of samples were
written down on IR-Fourier spectrometer FTIR-8400S ("Shimadzu") in the rate of 700-4000 cm-1 with the resolution of 4 cm-1. Scanning was processed by the software of IR Solution.

IR-spectra of lignosulphonates of various manufacturers are similar, in figures 1 and 2 ranges of lignosulphonates of sulphitic and neutral-sulfite pulping methods are presented.



Figure 1.a) LST IR spectrum (neutral-sulfite) Syasski Pulp and Paper Mill; b) LST IR spectrum (sulphitic) Solikamski Pulp and Paper Mill

Spectra are characterized by the following strips of absorption: 750-800 cm-1 (CH2 endocyclic benzene bonds); 1190-1210 cm-1 (SO3-groups); 1020 cm-1 (OH-groups); 1050-1100 cm-1 (OH-groups of alcohols); 1450, 1505 and 1560 cm-1 (replaced E-ring of a lignin); 1750-1600 cm-1 caused by fluctuations of carboxyl group and fluctuations of C=C endocyclic benzene bonds; insignificant peaks in the rate of 1650-1780 cm-1 are characteristic of C=O of carbonyl groups; 1680-1700 cm-1 belong to C=O to groups of aromatic acids; 1690-1725 cm-1 characterize COOH-groups; 1420 cm-1 belong to CH3; 2846 cm-1 of CH2 belong to aliphatic bonds.

Therefore, lignosulphonates represent the anion-active polymers containing methoxy, phenolic, hydroxyl, carbonyl, carboxyl and sulphonic-acid groups.

Thus, structure and properties of neutral-sulfite lye make it possible to produce its modifications and use them together with traditional raw materials as crude in manufacturing of reagents for oil and gas industry [2].

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Herstellung von keramischen Bauteilen auf der Basis von natürlichen Rohstoffen (изготовление керамических деталей на базе естественного сырья)

Ursprünglich wurde der Begriff "Keramik" aus natürlichem Ton hergestellte Erzeugnisse bezeichnet. Aber solche Definition entspricht den heutigen Vorstellungen nur teilweise. Derzeit kann Keramik als eine Gruppe von Erzeugnissen mit gemeinsamen Merkmalen definiert werden. Keramische Erzeugnisse werden aus einem oder mehreren natürlichen und künstlichen anorganischen nichtmetallischen Werkstoffen durch vorheriges Zerkleinern, Mahlen und Mischen bei Bedarf mit Zusatz von Bindemittel-Komponenten. Es folgt die Formation des Halbfabrikates aus den erhaltenen Massen und abschließendem Brennen für die Herstellung der fertigen Produkte in der vorgegebenen Struktur.

Die Herstellung von Keramik zählt viele Tausende von Jahren. Die einzigartigen Eigenschaften (Plastizität und eine geringe Wasserdurchlässigkeit) sind seit langem bekannt. Die Ausgangsmaterialien bei der Herstellung keramischer Körper sind stets pulverförmig. Die Pulver selbst können entweder plastisch oder spröde sein. Zu den plastischen Rohstoffen gehören Kaolin und Ton, zu den spröden die Porzellanrohstoffe Quarz und Feldspat. Die tonkeramischen Werkstoffe unterscheiden sich von anderen keramischen Werkstoffen durch einen Mindestgehalt an Tonmineralen von 20%. Von dieser Gruppe hat vor allem das Porzellan technische Bedeutung. Dessen Abgrenzung gegen die ebenfalls ton- und feinkeramischen Produkte Steinzeug und Steingut ist fließend. Alle drei Werkstoffe besitzen nach dem Brand als wesentliche kristalline Phase den Mullit $3Al_2O_3 \cdot 2SiO_2$.

Ton und Kaolin werden in der Natur schon pulverförmig gefunden und müssen nicht noch zerkleinert werden. Sie haben drei gemeinsame Merkmale: ein feines Korn, ein großes Wasserbindevermögen und ihre plastische Verformbarkeit. Vor der Herstellung zu der brennenden Masse werden Quarz und Feldspat feinkörnig zerkleinert, in der letzten Stufe auf mittlere Korngrößen von 0,5 µm bis 10 µm. Anschließend werden die Porzellanrohstoffe möglichst homogen gemischt und zu einer feuchten, plastischen Masse oder zu einer rieselfähigen Trockenpressmasse weiterverarbeitet. Die Formteile können durch Schlickerguss oder Pressen hergestellt werden. Beim Gießen wird eine wässrige Suspension der Masse in eine Gipsform gegossen. Der Gips entzieht dem Schlicker das Wasser, so dass die festen Teilchen der Suspension das Formteil bilden. Bei Trockenpressen wird eine krümelige Masse mit geringem Feuchtigkeitsgehalt verdichtet. Die Vorteile dieses Verfahrens liegen in der großen Maßhaltigkeit der Produkte, in der Herstellung von Teilen mit ebenen Flächen und scharfen Kanten und in der guten Automatisierungsmöglichkeit.

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Wunderschöne Verbindungen (Удивительные соединения)

Die Fullerene C_{60} und C_{70} kommen natürlich in Shungit und Fulgurit aber auch molekular im interstellaren Medium vor. Das ist ein braun-schwarzes Pulver mit metallischem Glanz. Sie lösen sich in manchen organischen Lösungsmitteln unter charakteristischer Färbung. Verschiedene Möglichkeiten können zur Verwendung als Katalysator, Schmiermittel, zur Herstellung künstlicher Diamanten, in der Medizin, als Halbleiter und Supraleiter geforscht werden. Aufgrund der Bindungsverhältnisse im Molekül kann es extrem viele Radikale aufnehmen und binden. Eine Studie von 2012 berichtet, die orale Gabe von C_{60} aufgelöst in Olivenöl bei Ratten zeige keine toxische Wirkung und habe die Lebensdauer der Ratten nahezu verdoppelt.

Fullerene sind selbst organisierende Strukturen und sind die dritte Form von Kohlenstoff, zusätzlich zu den bekannten Strukturen von Diamant und Graphit. Sie können 28 bis 100 Kohlenstoffatomen entdecken, aber die stabilste Molekül C₆₀ und C₇₀. Fullerene - eine molekulare Form von Kohlenstoff. Die Kristallstruktur des Fullerens ist ein periodisches Gitter aus Fullerenmolekülen und in kristallinen Fulleren-Fulleren-Molekülen ein flächenzentriertes kubisches Gitter. Isomer C60 ist am einfachsten und berühmtesten. Der Name wurde nach dem Futurist Architekten Richard Buckminster Fuller, der die Strukturen, kuppelförmigen Rahmen geschaffen, benannt, die aus Fünf- und Sechsecken bestanden.

Das effektivste Verfahren zur Herstellung die Verbindung basiert auf der thermischen Verdampfung von Graphit oder durch ohmsches Erhitzen der Graphitelektrode oder Laserbestrahlung. Als Rohstoffe außer Graphit kann ein Flüssigkristall Mesophase genutzt werden. Es wurde thermische Zersetzung von kohlenstoffhaltigen Substanzen durch katalytisches Verfahren entwickelt.

Aufgrund dieser Verbindungen werden neue Klassen von Polymeren mit den gewünschten mechanischen, optischen, elektrischen, magnetischen Speicherung von Informationen, neue Arten von Katalysatoren und Sensoren, neue Beschichtungen und Schmiermitteln, neue Arten von Kraftstoffadditiven und Kraftstoffe, Kapseln für die sichere Entsorgung radioaktiver Abfälle, Verbindungen für Pharmakologie und Medizin, Biologie und Kosmetologie ausgearbeitet. Eine Reihe von Studien wurde mit Fragen der Verwendung von Fullerenen als neues Material für traditionelle Anwendungen in der Elektronik, als Additive für synthetische Diamanten durch Hochdruck verbunden. Sie können auch in der Pharmakologie verwendet werden, um neue Medikamente zu schaffen. Somit 2007 wurden Studien durchgeführt, um diese Verbindungen für die Entwicklung von antiallergischen Mitteln herzustellen. Trotz der Abwesenheit von Wasserstoffatomen kann diese Verbindung immer noch durch unterschiedliche chemische Verfahren funktionalisiert werden.

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Improving the production of PVC technology using defoamer (Усовершенствование технологии производства поливинилхлорида с использованием пеногасителя)

One of the most important areas for improvement PVC production technological process is to develop a method to combat foaming. Since the foam that is formed by the action of surfactants, emulsifiers and stabilizers used in the production of PVC solidifies on the surface of the reactor and a reverse condenser in a form of crusts it significantly complicates the process.

The best way to reduce foaming is to use chemicals, called antifoam. The most widely used group is defoamers from silicone macromolecular compounds - they are stable, chemically inert, cheap and effective at high temperatures. Their operating principle is based on the increase of the interphase tension at the water-vapor level. It suppresses foaming at reaction mass "boiling" and prevents the reverse pipe heater condenser from getting the polymerization medium into it [1].

In this connection, tests of a silicone defoamer of the Russian company LLC "PENTA-91" were carried out in order to reduce foaming during suspension polymerization. The aim is to select and investigate the effect of dosage defoamers "Penta" on the technological parameters of the mode and quality of the polymer. To study the effectiveness of various defoamers the apparatus was created, which allows to determine the coefficient of the foam. Defoaming composition was determined on a model consisting of a mixture of emulsifiers used in the polymerization of vinyl chloride formulation.

It was found that the use of Penta-4604 defoamer has no negative impact on the polymerization process parameters. Addition of "Penta-4604» in amount 0,009 - 0,013 g of basic substance per 1 kg of the PVC slurry reduces foam volume by 1.5-2 times.

Overall, these results indicate that antifoam "Penta-4604" can be recommended for defoaming in the process of vinyl chloride suspension polymerization.

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Reduktion von Zongorin (Восстановление зонгорина)

Alkaloide sind natürlich vorkommende, chemische Verbindungen, die heterocyclisch gebundene Stickstoffatome enthalten. Durch das freie Elektronenpaar am Stickstoffatom bedingt reagieren Alkaloide zumeist. Alkaloide sind in der Mehrzahl Derivate von Aminosäuren. Sie kommen in der Natur zumeist in Pflanzen vor, wie beispielsweise das Morphin, welches neben anderen Alkaloiden im Schlafmohn enthalten ist.

Aconitin zählt zu den am stärksten wirksamen pflanzlichen Alkaloiden, es wird rasch über die Schleimhäute und die intakte Haut resorbiert, passiert die Blut-Hirn-Schranke und verändert die Erregbarkeit von Nervenzellen. Dadurch wirkt es zunächst erregend, dann lähmend auf sensible und motorische Nerven sowie auf das ZNS. Sehr viele dieser Alkaloide zeigen starke pharmakologische Wirkung. Sie werden beispielsweise als Analgetika nach Operationen oder Sedativa verwendet. Alkaloiden wird auch halluzinogene Wirkung zugesprochen.

Zongorin, Napellin,12 Epinapellin und Derivate haben große Aufmerksamkeit der Forscher wegen hoher biologischer Aktivität hervorgerufen. Die Frage der Verfügbarkeit eines bestimmten Alkaloids spielt oft eine wichtige Rolle bei der Herstellung von Arzneimitteln. Das meist verfügbare Alkaloid ist Zongorin, Napellin und 12 Epinapellin kommen seltener vor, und die Forscher brauchen Wege zu finden, um aus dem mehr zugänglichen Zongorin das weniger zugängliche Napellin und 12 Epinapellin durch die Übergangsstufen herzustellen.

Es wurde Zongorinreduktion unter Verwendung von Natriumborhydrid und Lithiumaluminiumhydrid beschriebenen, was zu dem Gemisch von Napelin und Epinapelin führt (1:1), doch die Reaktion von Zongorin und seiner Derivaten mittels Einwirkung von anderen Reduktionsmitteln wurde noch nicht untersucht. Das Verhältnis von $12-\alpha$ -/ $12-\beta$ -hydroxy wurde von uns entsprechend dem 1 H-NMR-Spektrum bestimmt. 1H-NMR-Spektren von 13C- und 12 Napellin, Epinapellin waren 1987 von Sultankhodzhaev beschrieben, aber volle Untersuchung der 1H-NMR-Spektren korrekturbedürftig waren. Für 12-Epinapellin wurde volle Untersuchung durchgeführt. Volle Zuordnung der Protonensignale im1H-NMR-Spektrum von 12-Hydroxy zeigte zwei deutlich unterschiedliche Signale H und 20-2H-17-Spektren von $12-\alpha$ - und $12-\beta$ -Alkoholen, die die integralen Intensitäten dieser Signale ermöglicht, das Verhältnis der Isomeren zu bewerten.

Nach unseren Schätzungen die Wiederherstellung von NaBH₄ / MeOH gibt das Verhältnis Zongorin Napellin /12Epinapellin 35/65. Wir haben das Wiederherstellungsverfahren Lushe NaBH₄ / CeCl₃x7N₂O in Methanol in einem Molverhältnis Zongorin / NaBH₄ / CeCl₃x7N₂O = 1: 1.261.2 bis zu einer Mischung aus Napellin / 12 Epinapellin 35/65, Napellin / 12 Epinapellin 7/93 durchgeführt.

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NEW METHOD OF SYNTHESIS OF BENZYL-BUTYL ETHER BY COMPOUNDS AND COMPLEXES OF COPPER (Новый метод синтеза бензилбутилового эфира под действием соединений и комплексов меди)

Benzyl-alkyl esters with different odors are valuable aromatic substances in perfume, cosmetic and food industries.

Benzyl-butyl ether has a fruity smell and is allowed in many countries for using as a flavoring of food (ice cream, ice, drinks, desserts, cookies, etc.).

There are the methods of processing of benzyl-butyl ether:

Benzyl-butyl ether of 90% yield is prepared from benzyl bromide and 1-butanol in the presence of a stoichiometric amount of flammable and highly explosive sodium hydride in dimethyl formamide (DMF)



Benzyl-butyl ether can be synthesized in transfer catalysis conditions using a polymer quaternary ammonium salt.



Benzyl-butyl ester is also processed from butyl and benzyl alcohols in the presence of a rhenium-containing catalysts.



The above methods are very complex, flammable and highly explosive, in the synthesis are used expensive catalysts, so the purpose of my work is effective and safe method of ether processing.

The offered invention relates to a process for preparing benzylbutyl ether



[CuBr₂]:[BnOH]:[ROH]= 1:100:400

The feedstock for benzyl-butyl ester is benzyl alcohol which is reacted with n-butanol under the influence of CuBr2

The advantages of the method is low price and availability of CuBr2 catalyst, absence of by-products, the selectivity of the process: by conversion of benzyl alcohol in 99.4% the selectivity of the reaction for benzyl-butyl ether is 91%.

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Thermodynamic parameters of 6-methyluracil dimerization. DFT study (Термодинамические параметры димеризации 6-метиурацила. DFT исследование)

It is known that 6-methyluracil (Fig. 1) in the crystalline phase can form two polymorphic supramolecular structures¹. The first is a network structure in which the fragments are combined into uracil dimers 3-3 through two hydrogen bonds N3-H...O2=C4. These dimers,

formed from 3 detection centers, are combined in layers via connections N1-H...O2=C4, and C5-H...O1=C2 interaction occurs between the molecules of the different grids due to Van der Waals repulsion of methyl group from C2=O1 group oxygen. H-bond associates as chains with alternating contacts 1-1 and 3-3 are present in the ribbon-shaped structure of 6-methyluracil.



Fig. 1. The structure of the 6-methyluracil molecule with marked atoms and identification centers.

In this work modeling of dimeric structures of 6-methyluracil by methods of a quantum chemistry was carried out. Dimerization equilibrium thermodynamic parameters were calculated (Table. 1). Quantum chemical calculations were performed using the software package Gaussian09. The main approach used was hybrid functional theory DFT TPSSh² in conjunction with the basis set of triple valence splitting TZVP³. Thermodynamic and geometric parameters were calculated under standard conditions at a temperature of 298°K.

It was found that the structure of a dimer 1-1(Fig. 2) has the most favorable enthalpy and energy of Gibbs of dimerization (Table. 1). Thus, results, obtained in our previous works, suggest that the most energetically favorable dimeric form of uracil⁴, 5-fluorouracil⁵, 5-chlorouracil⁵, 5-methyluracil⁴ and 6-methyluracil is 1-1 dimer structure. Such interactions were experimentally found in the crystal structures of the belt type of 5-fluorouracil⁶, 5-chlorouracil⁷, 5-bromouracil⁷, 6-methyluracil¹ and grid type of 5-hydroxy-6-methyluracil⁸.

Table 1. Equilibrium thermodynamic parameters of 6-methyluracil dimers formed by various detection centers, kJ/mol

Dimer	$\Delta_{\rm d} { m H}^0$	$\Delta_{\rm d}G^0$
1-1	-67.3	-21.9
1-2	-49.2	-5.1
1-3	-55.3	-10.8
1-4	-43.3	-1.9
2-2	-36.8	5.9
2-3	-39.3	3.9
2-4	-25.7	13.9
3-3	-42.6	1.1
3-4	-28.6	11.6
4-4	-20.7	15.9



Fig. 2. Structure of a 1-1 6-methyluracil dimer

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Polyaniline and polypyrrole: where are we headed? (Полианилин и полипиррол: куда мы движемся?)

Tremendous advances have been made during the past decade in our understanding of the chemistry, electrochemistry, structure, electrical and optical phenomena, processing and applications of polyaniline and polypyrrole and their derivatives. This constantly growing scientific foundation continues to disclose new emerging chemical and physical properties of these materials, which present a vast area of as yet unexplained or incompletely understood phenomena. The very great interest in these polymers is due largely to their relative ease of synthesis by chemical or electrochemical oxidative polymerization of the monomers and to their very considerable potential technological importance.

Until relatively recently, polyaniline, probably the oldest known synthetic organic polymer, consisted of an ill-defined class of materials obtained by the chemical or electrochemical oxidative polymerization of aniline.

It is clearly apparent from what we knew 10 years ago and from what we know about polyaniline and polypyrrole, that enormous advance have been made during the past decade in the basic science and potential technological applications of these polymers and their derivatives. However, there remain many unanswered questions.

The future will be determined by two chief thrusts driven by different forces: (i) fundamental science: determination of factors responsible for promoting high conductivity – experimental and theoretical upper limits; (ii) Technology: determination of factors responsible for promoting greater thermal, oxidative and hydrolytic short – termstability during, for example, processing and long-term stability during application for some specific purpose; use of blends/composites of conducting polymers with conventional polymersto exploit the most attractive features of each.

The next decade will undoubtedly bring forth new fundamental science and applications that are: (i) logical extensions of what is already known and (ii) completely new unexpected science and technology.

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Determination of properties of lignosulfonate reagents by modern methods of analysis (Определение свойств лигносульфонатных реагентов современными методами анализа)

Drilling fluids are widely used in drilling. Chemicals reagents are necessary for drilling fluids to impart technological properties during their preparation, for example, they are used to protect drilling fluids from surrounding influences: sludge cuttings, temperatures, pressures, fluids formation aggression, etc. It is known that a lignosulfonate drilling reagents possess inhibitory properties [1].

The aim of the study was a comparative study of anticorrosion properties of modified lignosulfonate reagents by gravity metric and energy dispersive X-ray fluorescence (ED-XRF) analysis methods [2].

Metallic plates were analysed in static conditions in the aged inhibited and uninhibited test environments, with subsequent assessment of protective ability of the inhibitor on changing the weight of plates and the rate of corrosion. Stratal water was used as an environment test. ED-XRF analysis was performed on the spectrometer EDX-800HS «Shimadzu», the elemental composition of the plates was determined. The results of the protective capacity of gravimetric method prototype and ED-XRF are comparable. The greatest protective effect in samples No1 and No2 is at a concentration of 1.0% of the weight.

The lowest corrosion rates for additive solutions are with a concentration of 1.0% of the weight for the sample $N_{2} - 1,39 \cdot 10^{-8} \text{ g} \cdot \text{mm}^{-2} \cdot \text{ch}^{-1}$, and the sample $N_{2} - 3,77 \cdot 10^{-8} \text{ g} \cdot \text{mm}^{-2} \cdot \text{ch}^{-1}$.

The results of specification of the particles diameters and their size distribution by laser diffraction method in lignosulfonates patterns obtained by sulphite and neutral-sulphite pulping methods are presented as well as drilling agents modified on their basis.



Figure 1. The differential and integral distribution of particles in the initial sample lignosulfonate



Figure 2. The differential and integral distribution of particles in a sample in modified lignosulfonate

It is shown that the size distribution of particles on initial lignosulfonates sizes is within the range from 0.01 to 1 micron with the average particle size 0.4 microns, in modified lignosulfonate drilling agents the particles size ranges from 0.5 to 6 microns. Moreover, modification with phosphonic groups leads to an increase of the particles diameter to almost 1 micron. The presence of some particles with a size up to 6 microns indirectly indicates on their associative nature.

It should be noted that the formation of ion associates, clusters is a characteristic feature not only of lignosulfonates and also of the other polyelectrolytes. It is possible, that the formation of associates should happen due to hydrogen bonds and hydrophobic interactions of macromolecules.

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Polyfructozan inulin's modification by sintons – ascorbic acid, glycine, taurine (Модификация полифруктозана инулина синтонами – аскорбиновой кислотой, глицином, таурином)

The possibility of carrying out chemical modification of structure of polysaccharide of inulin by organic acids for the creation of new antidiabetic medicines is investigated. α -ascorbic acid, glycine, or taurine are used as sintons. The implementation of the modification of the structure of polyfructosans inulin by introduction in the structure of inulin, one of synthons, each of which is used for diabetes medication, may enhance the biological activity of inulin with the formation of compounds having a complex of therapeutic antidiabetic properties. The synthesized conjugates of inulin have been cleared by a columnar chromatography on silicagel and characterized by infrared, a nuclear magnetic resonance ¹H, a nuclear magnetic resonance ¹³C of spectroscopy methods. The solubility of a conjugate of inulin with ascorbic acid, inulin conjugate with glycine, a conjugate of inulin and taurine are determined. The resulting conjugates are water- and alcohol-soluble, but poorly soluble in organic solvents (petroleum ether, diethyl ether, benzene, chloroform, acetone). Hydrolytic cleavage of the investigational products is carried out in two stages. The first stage is to conduct acid hydrolysis to break down the $\beta(2 \rightarrow 1)$ -glycosidic linkages. The second stage is to determine glucose in alkaline hydrolysate with the help of iodometric method by Willstatter. Inulin content, used to obtain conjugates, is determined by a spectrometric method based on the ability of sugars to form products having absorption maxima in the region of 200 - 380 nm when heated with concentrated acids. The studied commercial inulin contains 98.57 % in terms of inulin to fructose. Under the conditions of the hydrolytic cleavage of the inulin and synthesized inulin conjugates the correspondence of the quantitative contentrelated glucose conjugates with respect to its content in the original substance is shown. The amount of glucose in the inulin hydrolysate and the amount of glucose in the hydrolyzate of the conjugate of inulin with ascorbic acid is similar in the case of the analysis of hydrolysis products of inulin conjugate with taurine, the value is too low. We believe the value is too low because of insufficient purification carried out after synthesis of the inulin conjugate with taurine.

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Studying the influence of nonelectrolytes on the exit of drugs from a polymeric film (Изучение влияния неэлектролитов на выход лекарственных веществ из полимерной пленки)

The transport of drugs from system of controlled delivery of drugs occurs generally due to diffusion. In the works of last years [1-3] release of drugs from a polymeric matrix on the basis of a chitosan has been studied in detail. In all cases the process of diffusion didn't submit to classical diffusion of Fick which is testified by values of n less than 0,5 in Ritger-Peppas's equation. We have assumed that it is connected with the fact that the used drugs represented electrolytes and exerted impact on structure and properties of a polymeric matrix.

For checking this hypotheses in this work the influence of drug nonelectrolytes on their transport from a polymeric matrix has been studied.

As a matrix chitosan was used, as drugs – chloramphenicol. Chitosan films have been created from solution of 1% acetic acid. The concentration of polymer in initial solution was 1%. The thickness of films in all experiments was supported constant and equal to 0,1 mm. The drug in the form of powder was brought in chitosan solution just before formation of a film. Concentration of drugs in a film was 0,01 and 0,1 mol/ mol of a chitosan.

The kinetics of drug release from films on water medium at a temperature of 37 °C was studied by method of UV-spectrophotometry of water solutions in the field of maximum of absorption of drugs. For establishment of the mode of release of drug the kinetic curves were processed on the equation: $G_t/G_{\infty} = kt^n$.

The conducted researches have shown that in case of the system chitosan - chloramphenicol the values of n is more than 0,5. This fact demonstrates that the limiting factor is process of relaxation of a polymeric chain, but not diffusions as it was in earlier studied cases when drug represented electrolyte. Isothermal annealing of the received films leads to a relaxation of polymeric chains because values of an indicator of n becomes equal to 0,5.

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The peculiarities of drug release from chitosan films (Изучение закономерностей выхода лекарственных веществ из хитозановых пленок)

Nowadays, works on creation delivery systems of drugs are widespread. There is a number of kinetic models to describe the kinetics of drug release in such systems. Kinetic modeling allows us to determine the main forms of drug transport and to predict the influence of parameters of the matrix construction (shape, size and composition of the matrix tablet) on the rate of the drug release.

The aim of this work is to study the kinetics of drug release from the polymer matrix. As the matrix was used chitosan. As the drug was used antibiotic (chloramphenicol).

The kinetics of chloramphenicol release from the films in an aqueous solution at the temperature of 37° was studied by the method of UV-spectrophotometry in the matter of maximum absorption of the drug.

The release of chloramphenicol from the matrix film of acetate chitosan is carried out quickly within a few hours. Therefore, for prolonging the drug release is used thermal modification. Conducting thermal modification of films leads to a significant decreasing of dissolution rate of the film. Already after 30 minutes of annealing the film, the used sample of chitosan acetate stops to dissolve in water.

In this paper we analyze two equations:

1) Ritger – Peppas equation, which can be used for describing the general behavior of drug release from swelling polymeric matrices in the form of film, sphere and cylinder.

 $Gs/G \infty = Ktm$

(1),

2) Hopfenberg equation describes the release of drug from eroded films, spheres and infinite cylinders

$$\frac{M_t}{M_{00}} = 1 - [1 - k_0 t / C_0 a_0]^n \tag{2}$$

Analysis of processing of the kinetic data in equation coordinates (1) and (2) showed that, in the case when the matrix is soluble, Hopfenberg equation describes kinetics of drug release from the polymer matrix best, and in the case when the matrix is insoluble, the best solution is in Ritger - Peppas equation.

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Die Analyse der Dynamik des Reisenverkaufs in der Republik Baschkortostan (Анализ динамики реализации туристических путевок в Республике Башкортостан)

Der Tourismus ist eine der wichtigsten Wirtschaftsbranchen eines jeden Landes und jeder Region, denn der Hauptanteil der Geldmasse verdient gerade er. Aber nicht in allen Regionen Russlands entwickelt sich der Tourismus gleichmäßig.

Die Republik Baschkortostan hat ein riesengroßes Potential für die Entwicklung des Tourismus. In der Region gibt es viele Naturdenkmäler, kulturelle und historische Sehenswürdigkeiten sowie ihre Traditionen und Kultur, die unsere Gäste sehen können. Seen, Wasserfälle, Höhlen, Flüsse, Berge, Hügel – das alles können die Touristen besichtigen, wenn sie in die Republik ankommen. Die Zeidlerei und der baschkirische Honig, Kali-Salzkraut sind Visitenkarten von Baschkortostan. Die Sanatorien der Republik sind für Stutenmilchheilung bekannt.

In der Periode zwischen 2006 und 2014 stieg die Zahl der Pauschalreisen in der Republik Baschkortostan jedes Jahr um 3025 Reisen oder um 4%. Eine Durchschnittsrate für diese Zeit betrug 51274 Reisen. Im Jahre 2014 stieg der Verkauf der Reisen im Vergleich mit dem Jahr 2006 um 77%. Aber das Jahr 2014 zeigt eine Senkung um 15,7 % im Vergleich zu 2013. Diese Senkung kann man durch geopolitische Situation im Land und in der Welt erklären.

In der Periode von 2006 bis 2014 stieg die Zahl der verkauften Auslandspauschalreisen in Baschkortostan jedes Jahr um 1532 oder um 8%. Die durchschnittliche Zahl betrug 28374 Reisen pro Jahr während dieser Zeit. Im Jahre 2014 stieg die Zahl der verkauften Reisen um 82,4% im Vergleich zu 2006, aber 2014 gab es eine Senkung um 32% im Vergleich zu 2013.

In der Periode von 2006-2014 stieg die Zahl der in Baschkortostan verkauften Pauschalreisen um 1502 Reisen oder um 8% jedes Jahr. Die durchschnittliche Zahl der verkauften Reisen in dieser Periode betrug 22894 Reisen pro Jahr. 2014 stieg der Verkauf der Pauschalreisen im Vergleich zu 2006 um 72,3%.

Unsere Analyse zeigt also, dass sich der Tourismusmarkt in der Republik Baschkortostan ständig entwickelt und meistens eine Steigerung aufweist.

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Cost management for production in LLC "SHAYMURATOVO" (Управление затратами на производство продукции в ООО «ШАЙМУРАТОВО»)

The main reasons for updating cost management at the present stage are: 1) the expansion of the production in the conditions of limited resources and increased investment in innovation; 2) saturation of the market with products equivalent in terms of quality and purpose; 3) improving production technologies based on innovation.

Activity of any enterprise involves certain costs. The cost of production and sales includes raw material costs of main and auxiliary materials and components; fuel and energy costs; the cost of basic and additional wages, including deductions for social insurance; depreciation deductions; other cash costs; non-manufacturing costs.

Cost management is a key tool in the production organization of the company. Identification of internal reserves contributes to the possibility of cost reduction and their more efficient use. This predisposes to increased economic efficiency, higher rates of profit increment and profit margins.

To solve the problem of production cost saving and sales at the enterprise the comprehensive concept (program) should be developed and annually adjusted to reflect the changes at the enterprise. This program must be comprehensive, i.e. it should take into account all the factors that affect production cost saving and sales. The content and nature of the comprehensive program to reduce production costs depend on the specifics of the enterprise, the current state and prospects of its development.

Let us consider the classification of costs for LLC "SHAYMURATOVO" which allows to keep track of the profitability trends existing in the organization and also to get a real and objective picture of the cost of various production units.

In order to create a more complete picture of the costs of LLC "SHAYMURATOVO", let us consider them in terms of fixed and variable.

Name	2013	2014	2015	2014/2012, %
Material expenditures	2417	1434	1581	65,4
Electric power	-	-	-	-
Petroleum products	-	-	-	-
Labour costs	54	60	72	133,3
Social contributions (premiums)	11	13	16	145,5
Other costs	35	139	1473	420,9
Income from the sale of agricultural products and processed products	2376	884	1721	72,4
Profit (Loss)	80000	80000	1000	25

Table 3.1 Calculation of the total production cost in 2010-2015, ths. Rub. in LLC "SHAY MURATOVO"

Considering the figures for three years, it should be noted that there is a noticeable change in performance. Material costs in 2015 decreased significantly compared with 2013, the decrease was 65.4%. © Ахунова Гульназ, 2016

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To the question concerning implementation of "wet" leasing into the legislation of the Russian Federation (К вопросу внедрении «мокрого» лизинга в законодательство Российской Федерации)

At the end of 20th century leasing became one of the most important instruments of investment in Russia. However, the existing mechanism of leasing is not effective enough.

The research is dedicated to the problem of "wet" leasing: its practical application and implementation into the Russian Federation's legislation as the specific type of leasing in the aviation sphere. The essence of "wet" leasing is that the lessor provides full service for leasing item.

The necessity of "wet" leasing was discussed by experts on the conference which was dedicated to financing and leasing of the aviation in Russia and the Former Soviet Republics.

First of all the practice of wet leasing will create great possibilities for the start-up of small airline companies. For example, at the beginning of its activity EasyJet company obtained two Boeing 737-200 by means of wet leasing.

Secondly, use of "wet" leasing will let to test new models of airplanes with less expense for lessee. Thus at the end of 2013 Royal Air Maroc company attained SSJ for this purpose.

Finally full service of leasing item (aircraft) will guarantee immediate reaction of airline companies in such cases as public contract on passenger carriage, cultural occasions and seasonal demand.

It is important to emphasize that "wet" leasing is widespread in many countries (USA, Canada, India, Turkey and so on). This fact indicates all essence and relevance of "wet" leasing implementation into domestic practice and legislation. It will lead to positive effect not only in international economic cooperation but also in internal leasing activity.

In conclusion we offer to supplement the legislation with new provisions. The following norm shall be appended to Russian Civil Code's Article 665: "peculiarities of lease contract leasing item of which is aircraft". Air Code should be complemented with new Chapter 16.1 "Aircraft Leasing" where "wet" leasing will find its place.

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Die Theoretischen Aspekte der rationalen Nutzung von materiellen Regionalressourcen (Теоретические аспекты рационального использования материальных ресурсов региона)

Unter den Bedingungen der Marktentwicklung der regionalen Wirtschaft ist es notwendig nicht nur das Ansetzen des Tempos der Produktion und die Erhöhung der Konkurrenzfähigkeit, sondern auch die ressoursenaufbewahrende Erhöhung. Der Prozess der Effektivität der regionalen Produktion hängt im großen Maße davon ab, inwiefern es qualitativ und voll die Ressourcen verwendet werden. Die rationale Nutzung der materiellen Ressourcen der Region ist ein aktuelles Problem zur Zeit.

Die materiellen Regionalressourcen ist eine Gesamtheit des materiellen Wohlstendes, die die Gesellschaft im Laufe der ausgedehnten Produktion benutzt. Sie erfassen alle materiellen Elemente der Produktion, die die natürlichen Materialien aufnehmen und zwar: die Gegenstände der Arbeit, die den Prozess der Produktion des Wohlstandes und die Dienstleistungen gewährleisten. Es gibt verschiedene Arten der Verwaltung von materiellen Ressoursen: die staatliche, kommunale, Verwaltung der Benutzerressource. Verschiedene Arten der Verwaltung wirken auf die materiellen Ressourcen in dieser oder jener Stufe, laut dem Kompetenzbereich ein. Als Subjekt der Verwaltung treten auf: die Gesamtheit der Organe der Staatsmacht; die Organe der Gemeinde; die Leiter der Unternehmen und der Organisationen. Als das Objekt tritt die Gesamtheit der materiellen Ressourcen auf.

Es ist bekannt, dass auf die Dynamik des Umfanges und die rationale Nutzung der materiellen Ressourcen die Reihe der Faktoren einwirkt, die in der Tabelle 1 vorgestellt sind

Die Tabelle 1 - die Faktoren, die die Dynamik des Umfanges und der rationalen Nutzung der materiellen Ressourcen beeinflussen

Die Benen-	Die	Die Faktoren, die auf die materiellen Res-
nung der	Einwirkung	sourcen einwirken
Gruppe der		
Faktoren		
Politisch	Äußerlich	1. Die Entwicklung und die Einführung
		der technischen Dienstordnungen und des
		Standards, die die Absage auf die Nutzung
		der veraltenden Technologien und die
		Ausrüstung fördern.
	Inner	1. Das Vorhandensein verschiedener staat-
		licher Programme nach der Rationalisie-
		rung der materiellen Ressourcen der kon-
		kreten Regionen.

Die Fortsetzung der Tabelle 1

		6
Ökonomisch	Äußerlich	1. Die umfangreiche Basis der mate-
		riellen Ressourcen der Region.
		2. Die Erhöhung der Konkurrenzfä-
		higkeit der Produktion.
	Inner	1. Die Erweiterung der Zusammenar-
		beit des Staates und der kleinen und
		mittleren Unternehmer.
		2. Die Organisation der abfallfreien
		und abproduktarmen Produktionen,
		die nochmalige Überarbeitung des

		Rohstoffs.
Sozial	Äußerlich	1. Die Vergrößerung der Arbeitsplät-
		ze, die Verkleinerung der Arbeitslo-
		sigkeit.
	Inner	1. Die entwickelte soziale Infrastruk-
		tur der Region.
		2. Das verhältnismäßig hohe Niveau
		des menschlichen Kapitals.
Ökologisch	Äußerlich	1. Die Übereinstimmung mit den
		Kennziffern des Auslands.
	Inner	1. Das Vorhandensein der kolossalen
		Vorräte der Naturschätze.
		2. Die Verschmutzung der Umwelt.
		3. Die Erschöpfung der Naturschätze
		der Region.

Die verhältnismäßig hohe Qualität des menschlichen Kapitals sagt darüber, dass Russland die besten Kennziffern nach der Erweiterung und der Fassbarkeit der 1. und 2. Bildung, sowie der Entwicklung der Infrastruktur hat.

Der Faktor des Vorhandenseins der kolossalen Vorräte der Naturschätze ist der Vorteil, aber gleichzeitig trägt es zur Erweisung der ernsten negativen Einwirkungen bei, die Stimulanz zur Modernisierung und die Erhöhung der Konkurrenz unterdrückend.

Russland bleibt im wesentlichen zurück. Das System der Überarbeitung und der Abfallverwendung der Produktion und des Konsums ist nicht entwickelt.

Es existiert das reale Bedürfnis nach der Veränderung des Funktionierens der nationalen Wirtschaft von der Rohstofforientierung auf innovative, ressourceaufbewahrende Orientierung. Vom Ziel der Veranstaltungen, die auf Ressourcesparen ausgerichtet sind, ist die intensive Suche der potentiellen und realen Quellen und der Reserven der Einsparung und der rationalen Nutzung der materiellen Ressourcen, dessen Ergebnis die Erhöhung der Effektivität ihrer Anwendung sein soll.

Man darf nicht solches Maß der Ressourcesparen, wie die nochmalige Abfallaufbereitung ausschließen. In diesem Zusammenhang ist es nötig zu bemerken, dass mit der Vergrößerung des Produktionsumfangs der Waren der Produktions- und Konsumbestimmung und die Umfänge der nochmaligen materiellen Ressourcen ständig wachsen werden.

Das Fazit ziehend, kann man Folgendes sagen, dass das erste und methodologische Hauptprinzip der Theorie der Wechselwirkung der Gesellschaft und der Natur, das Prinzip der optimalen Übereinstimmung der Gesellschaft und der materiellen Ressourcen sein soll. Das vorliegende Problem soll sich allmählich, beim Vorhandensein vom deutlichen Plan der Handlungen, den professionellen Fachkräften auf dem konkreten Gebiet entscheiden. Nur wird dann die Rationalität der materiellen Ressourcen nicht wie die abstrakte Idee, und wie der reale Wirtschaftsmechanismus erscheinen.

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