МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ
КАФЕДРА ІНОЗЕМНИХ МОВ
ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ ЦЕНТР

МАТЕРІАЛИ
X ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ СТУДЕНТІВ, АСПІРАНТІВ ТА ВИКЛАДАЧІВ ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ КАФЕДРИ ІНОЗЕМНИХ МОВ

"WITH FOREIGN LANGUAGES TO MUTUAL UNDERSTANDING, BETTER TECHNOLOGIES AND ECOLOGICALLY SAFER ENVIRONMENT"

(Суми, 24 березня 2016 року)
The tenth all Ukrainian scientific practical student`s, postgraduate's and teacher's conference

SECTION 1 HIGH TECH WORLD

THE USE OF LASERS

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I.A. Morozova – EL Adviser

Everybody knows, that lasers are widely used nowdays. For example, people use lasers in Medical Optical Coherence Tomography, laser marking, barcode scanners, laser pointers, holography and ultrafast photography.

Optical Coherence Tomography is a method of mapping below the surface in translucent or opaque materials, such as human tissue. Laser marking is a way of marking keyboards and electronic devices, cables, switches and automotive parts, medical instruments and animal ear tags. They encode manufacturing data to trace faulty parts, paint logos or write labels. Barcode scanners use a laser beam that is scanned back and forth so rapidly that it appears as a line to the human eye. Pocket-sized lasers are used to highlight important areas during presentations, and first became available in the 1980s. Holograms are typically created by reflecting laser light from an object and combining it with light from a reference beam. Ultrafast photography is an imaging technique that uses laser pulses to capture processes that happen so quickly they can't be snapped with regular camera shutters, like a electron escaping from an atom.

OCULUS RIFT

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Nowadays our world is closely connected with technologies. Changes come in people's lives with technology. People invent new gadgets, tools, machines and more useful things every day. As a rule, all these inventions make our life better and easier.

Now scientists are working on projects related to Virtual Reality. Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment. On a computer, virtual reality is primarily experienced through two of the five senses: sight and sound. One way to get into this virtual reality is Oculus Rift glasses.

The Rift is a virtual reality headset developed by Oculus VR. The Rift is scheduled for release on March 28, 2016, making it one of the first consumer-targeted virtual reality headsets. This is one of the kinds of the Virtual reality glasses. Rift is unlike anything you've ever experienced. Whether you're stepping into your favorite game, watching an immersive VR movie, jumping to a destination on the other side of the world, or just spending time with friends in VR, you'll feel like you're really there. On May 6, 2015, Oculus VR announced that the consumer version of the Rift will ship in the first quarter of 2016 with pre-orders starting on January 6, 2016. The consumer version is an improved version of the Crescent Bay Prototype, featuring per-eye displays running at 90 Hz with a higher combined resolution than DK2, 360-degree positional tracking, integrated audio, a vastly increased positional tracking volume, and a heavy focus on consumer ergonomics and aesthetics.

In this moment, these glasses make it possible to dive into virtual reality. But by the end of this decade, computers will become a powerful device to bring a full immersion in virtual reality. And then mankind will be able to use virtual reality in a variety of areas Education, Training, Video games, Fine arts, Heritage, Archeology, Architectural design, Urban design, Therapy and more different fields.

THE EYE TRIBE

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The Eye Tribe is an amazing technology that allows interacting with devices in unusual way. It is sure everyone wants to know how it works.

Eye Tribe Tracker is the world's most affordable eye tracker that comes with a software development kit. The Eye Tribe develops software that enables eye control on mobile devices and computers, allowing hands-free navigation. This enables you to integrate an eye tracking technology into your applications and games.

Eye tracking is the process of using sensors to locate features of the eyes and estimate where someone is looking (point of gaze). This technology relies on infrared illumination and uses advanced mathematical models to determine the point of gaze.

The Eye Tribe Tracker can detect the movement of the pupil with sub-millimeter precision. The average accuracy is around 0.5 degree of visual angle, which means that the system is capable of determining the on-screen gaze position roughly within the size of a fingertip (<10mm).

The Eye Tribe Tracker complies with the essential health and safety requirements set by the FCC and CE directives. The Eye Tribe Tracker is using near-infrared illumination, it conforms to the EN 62471 standard and this product has obtained EU declaration of conformity. This hardware has been tested and approved by a certified lab according to said standard, and is therefore safe to use.

The Eye Tribe software enables eye control on mobile devices, allowing hands free navigation of websites and apps, including eye activated login, enhanced gaming experiences and cloud based user engagement analytics. The Eye Tribe intends to become the leading provider of eye control technology for mass market consumer devices by licensing the technology to manufacturers.

DYSON SPHERE

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Some time ago, astronomers discovered a star with unusual brightness changes. The star is known as KIC 8462852, and is located in the constellation Cygnus. As a rule, slight and periodic changes in the brightness of a star is a normal process. Extinction of less than 1% says that the star passes the planet, which absorbs some of the light.

However, a feature of KIC 846 2852 is that fading is irregular and significant. It is from 15% to 22%. This phenomenon is difficult to explain by a group of comets or clouds of cosmic dust. Besides, after studying the images of this sky region, it was noticed that in less than 100 years, the brightness of the star has decreased by 20%. One of the explanations of such unusual phenomena is a Dyson sphere.

It is believed that the more developed the civilization is, the more energy it needs to consume. The scale of Kardashev shows that civilizations of the first type use all the resources of the planet, the civilizations of the second type use the resources of all- star system and the civilizations of the third type are capable of using all the resources that exist in the galaxy.

Human civilization uses different sources of energy - natural resources, nuclear energy, the energy of water or wind. But sooner or later, these resources are likely to become scarce. At the same time, each star is a huge thermonuclear reactor and produces a very large amount of energy which is emitted as light. But only a tiny part of its initial emanation reaches the earth, and can be used by people

In 1960, physicist Freeman Dyson came up with a conception of putting a huge amount of solar cells into the sun’s orbit, which could absorb and redirect the solar energy. These ideas evolved into

a concept of a huge sphere, called “the sphere of Dyson”, that could be constructed around a star for the purpose of complete absorption and usage of its energy.

It is believed that any civilization at a certain level of development will have to master the energy of its star, and constructions like the Dyson sphere let it come true. Searching Dyson’s spheres is a perspective direction of the SETIprogram on a search of extraterrestrial life, as they have a specific light (They do not emit a visible light while produce a strong ultrared radiation).

However, to overcome a star gravity, Dyson sphere should be rotated around its axis. But the centrifugal force is maximum at the equator, and equals zero at the poles of the sphere. Thus, the whole sphere has to be destroyed under the influence of these forces. Construction of a different shape might be the way out. Later Dyson suggested using of a sphere, which consisted of a separate objects cluster moving on independent orbits.

Other variants of modifications:

1. Dyson swarm
2. Dyson bubble
3. Dyson shell
4. Dyson net
5. Stellar engine

One of the most unusual implementations is the "World-Ring". It is a huge ring or torus around the sun. The ring accumulates the energy of the star. Besides, it is suitable for life.

Thus, it was conjectured that one of the reasons explaining the unusual glow of KIC 8462852 , could be the process of building Dyson sphere by some developed civilization for a long time.

FROM REAL TO VIRTUAL

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Each of us is a part of the Progress. Every our dream or our desire is a fuel of the big machine named – technology. Originally, humans are lazy, and therefore we not only survived but we become cleverer. What if an ancient human hadn't been so lazy and had not invented a wheel or spear? I think, It would be much harder to survive. However, let's continue.

Nowadays, science and technology have reached a high level of development, it is used everywhere, in every part of our life. In the last 20 years a new idea about creating a new machine that will be able to perform tasks that normally require human intelligence appears.

One day we will know everything about our world. And what will be next? We will create a new world! We have already started.

What do you know about AI? However, it does not matter how much you are aware of this, I will still tell you about it.

Artificial intelligence (AI) is the intelligence exhibited by machines or software. Major AI researchers and textbooks define this field as the study and design of intelligent agents in which an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. It has become an essential part of the technology industry.

Actually, research associated with artificial intelligence is highly technical and specialized.AI should solve a big number of problems, by using its knowledge and reasoning. It must analyze information, process and make conclusions by itself. However, it is hard to do, because if people want to make intelligence by themselves, firstly, we should understand how our own brain is working.

Nowadays we can excrete two basic lines of AI development:

- solving problems associated with the approaching of the specialized AI systems to human capabilities;

- creation of AI, which includes all already existing system.

A few of the longest standing questions that have remained unanswered are the following: should artificial intelligence simulate natural intelligence by studying psychology or neurology? Or is human biology irrelevant to AI research? For the years of learning a number of theories have appeared. There are logic-based, knowledge-based and sub-symbolic approaches.

Some developments of AI have already been used in everyday life. So, let's review some of them.

Banks use artificial intelligence systems (AIS) in the insurance business, while playing at the stock exchange. Form recognition methods (including more complex and specialized, as well as neural networks) are widely used in optical and acoustic recognition (including text and speech), medical diagnostics, spam filters, air defense systems.

AI is also used in education and music. Some people also can use elements of AI by 'Smart electro cars' (5 in Sumy) and 'Smart homes'.

Also safety systems worth mentioning. Safety is the condition of being safe; freedom from danger, risk, or injury.

Safety has always had a high priority to the implementation of technologies. Nowadays it is widely used in all fields and use such parts as:

- biometrics;
- covert surveillance systems;
- sensors, detectors, electronic analyzers.

Well, the last point is virtual reality. It is one of the greatest things ever. Why? Because virtual reality is a completely new world, where you can do whatever you want. Firstly, to control the process of making their own world people used difficult contraction, then they start to use a keyboard instead of a mouse. However, now we can use high technologies and wireless controllers. Also there is technology named IR Tracking and the principle of usage of 3D visualization, that are used in creating virtual reality.

In conclusion, it should be noted that some advancements we can use even now. And we have reviewed these examples.

ROBOTS IN OUR LIVES

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We've entered a new era: the twenty-first century. It's not hard to imagine the future in which robots are an integral part of our daily lives.

The field of robotics is complex. It's more than computer science and engineering. Disciplines ranging from medicine to philosophy are part of its foundation.

Robots do a lot of different tasks in many fields and the number of jobs performed by robots is growing steadily. For example, solar company Alion has developed the "Rover," a robot that can install solar panels rows along concrete bases using only an operator and a small team to create the foundation.

Medical robots are used in a range of medical practices, including difficult and precise surgical procedures. In a Medical Center of San Francisco University the scientists are trying to increase robotic integration in its facilities. This integration is not limited to a pair of robotic arms tucked away in an operating room. These robots are used to train surgeons, assist in difficult and precise surgical procedures, and to assist patients in recovery. Robots may also become useful tools to help children develop social skills. This robot can be used to relax and comfort sick children while they adopt procedures. Industrial robot has helped to change the industrial workplace. The use of industrial robots has helped to increase productivity rate and quality of distribution. Another type of robots can be used in the military. Some of them are built to be carried by soldiers helping them to complete their mission. Those robots are able to protect soldiers from dangerous situation and lessen the risk of putting soldiers in danger.

Today we can say only that robots won't just change our lives in the future, they'll expand it. Not just for fun, but for necessity. We made the first step in letting them into our homes, we just have to wait and the above-described robots will change our lives for the better.

THE APPLE SMART WATCH

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Henry van Dyke said: «Time is too slow for those who wait, too swift for those who fear, too long for those who grieve and too short for those who rejoice…». It is true, but it doesn`t mean that you don`t need a watch. Especially if it can send messages, give directions, track fitness and make wireless payments.

A former director of industrial design Robert Brunner recognized, that Apple poured its heart and soul into the outward. It is hard to disagree. The watch is beautifully constructed, attractive and fashionable. It will enrich your daily image and help to look more elegant and stylish. You can choose color, size and shape, that suited you most of all.

The Apple Watch has a lot of functions. It is a music player like an iPod; a fitness tracker with heart-rate measurements; a communications device that will send and receive calls and audio recordings. This watch can also control your Apple TV and act as a remote for connected smart-home devices. You can send love taps or audio messages like a walkie-talkie. It includes EasyJet, Salesforce, Shazam, WeChat and SPG Hotels, which will allow adopters to use the Apple Watch to unlock their hotel room.

The Apple Watch is very comfortable and easy to use. It has force-sensitive display with a button on the side for extra features. It is water resistant. It works on 18-hours battery and the 8GB of storage.

If you are looking for new technical devices, but disappointing, because it is too expensive, remember the saying by Jim Rohn: «Time is more valuable than money. You can get more money, but you cannot get more time».

DESIGNING OF PHOTOVOLTAIC ENERGY SYSTEM

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The problem of energy efficiency is one of the main problems of Ukraine, as our energy consumption in its economy considerably exceeds Western standards. Sumy State University(SSU) participates in the project on energy efficiency of higher education institutions of Ukraine "Higher Education. Energy and Sustainable Development "from the European Investment Bank. In this connection a comprehensive project "Energy Efficient University" was developed.

To reduce the power photovoltaic energy system was calculated for one of the buildings of SSU as it has a modern system of thermal insulation, good compass location and a proper roof structure, which allow to install solar panels without additional mounting structures. As a base for energy system photovoltaic system which connected to external power grids (on-grid) was selected. Its advantages are low cost, simplicity, reliability, possibility to use "green tariff" for extra energy generation.

As a result of research we have calculated possible amount of solar energy produced by our solar system. The quantity and range of brands which make solar panels, the optimal angle of installation have also been calculated. It was constructed 3D model of the case with a system of solar converters to visualize system using SketchUP. Analysis of the results shows that the designed photovoltaic system allows us to produce building energy independent from external energy and even supply surplus power to the external network.

The proposed method is quite available for being used to calculate the energy systems of other buildings and constructions.

ADAPTIVE CAMOUFLAGE

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The creation of adaptive camouflage is one of the main tasks for scientists. First of all, this technology is designed to be used in the army. It can push tactics in the battlefield to a higher level. However, all of prototypes that have been already created are still at the stage of testing and development.

The first prototype is based on the copying of the way an octopus disguises itself and still has no specific name. It was developed by a group of American experts headed by a material scientist John Rogers from Illinois University in cooperation with the United States Navy.

The fundamentals of the prototype's work are in use of flexible multilayer material with cellular structure. It contains three layers: • Basic substrate; • Silver reflecting layer; •Upper layer covered with thermo sensitive paint.

One more camouflage product is called "Quantum Stealth" produced by the Canadian company "Hyper Stealth" that has been working for the US Army since 2012. This company is specialized on creation of new types of camouflage. In 2015 the finished product was removed from production.

The third known prototype is being worked out by scientists from Canada and Germany for the Netherlands army. It is the most adapted one for the time being, but it still has a lot of drawbacks, such as a big size and fragmentation of the system. The project is called CAMELEON. The prototype of the system consists of active arrow of PLED pixels placed on a flexible upside, a camera and a laptop. PLED was developed by THO Holst Centre. It is a new polymer LED with highlight ability that makes it perfect for daily operations. One more advantage of PLED is easiness and low power consumption. Adaptive camouflage will permit to change military clashes from open conflicts to stealth-missions in future. It will really reduce the death rate among military and civil people. However, the application area of this technological invention is much broader.

ITER IS A CHALLENGE OF GLOBAL SOCIETY

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Nowadays, humanity requires more and more and more energy. What is more, present sources of energy can't provide modern society with it, besides, they are not rational and ecological enough, so that tends to be the only way to create new, radically new, source of energy and it is fusion reactor. Fusion reactor is a source of energy of new generation. ITER (International Thermonuclear Experimental Reactor) is a first step to create a commercially viable reactor. ITER elements in structure are very complex and expensive. Main parts of reactor are strong magnets, vacuum vessels, blanket, diverter and cryostat and they are supported by complex additional structures and it occupies 180-hectare site. In the nutshell the principle of working of this reactor is recycling isotopes of hydrogen in helium with massive energy releasing that occur due to thermonuclear reaction (the same as reactions inside the Sun) and creating hot plasma above 150 million degrees Celsius inside the reactor. In the incoming future if ITER is completed it will produce ecologically safe energy in amount of 500 MW for the first time instead of 50MW of input power and it will be a huge leap for the advancement of this technology worldwide. In conclusion it might be said that this invention is future of getting "unlimited" energy and it could give humanity new ways for developing science, clear technology and society. This safe and clear energy is our future.

WIRELESS ENERGY TRANSMISSION

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Technologies have never played such an important role as nowadays. We can`t imagine our world without them. They are spread everywhere.

Wireless energy transmission is transmission by using different electromagnetic wave frequencies. Different frequencies are needed to reach different goals.

In 1928 Hidetsugu Yagi invented magnetron. It wasn`t powerful enough to transfer energy but now people use it as a great radio antenna. Development of technology was increased after the Second World War. In 1964 the first microwave-fed helicopter prototype being controlled by radio was developed. In 1968 the proposition to transmit solar energy gathered by solar batteries with using microwave technology was given.

There are five major kinds of wireless transmission: ultrasonic, electrostatic induction, electromagnetic induction, microwave and laser.

Application is wide. We can charge mobile phones all over the room or another place. It has already been implemented in "WiTricity". Also there was a project to help a village be connected to electricity. It is situated in a place that can`t be connected by wiring. Orbital energy can also be gathered by it.

The advantages of laser as the most developed transmission technology are:

-small size;

-monochrome light beam;

-easy to control;

-insensitivity to other radiation.

The disadvantages are: high price, needs of straight line between a transmitter and receiver, complexity, efficiency, uselessness in foggy or rainy weather.

Such technologies can help people improve our world. Better technologies provide better future for further generations.

HOW 3D WITHOUT GLASSES WORK

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The technology of 3D without glasses is called autostereoscopy. Because this kind of three dimensional technology doesn't utilize special spectacles or headgear it became also known as glasses-less 3D or glasses free 3D. The methods of 3D technology without glasses include a parallax barrier, volumetric and holographic techniques.

The method of parallax barrier is widely used in modern 3D liquid crystal displays. Parallax barrier is a special device with a series of precision slits that's placed in front of LCD, serving as a filter for output image perception. However, the parallax method is not perfect, because it has some disadvantages. The first one is that in order to experience stereoscopic 3D effect the viewer must be positioned at a certain angle to the display.

Another type of autostereoscopic 3D is a volumetric display. This method relates to the construction of three dimensional images by means of various physical mechanisms. Volumetric displays use light fields to reconstruct 3D object in the volume of space. The created 3D images are thus measured in voxels (volumetric pixels) and can be seen with the unaided eye. A good example of volumetric imaging devices are 3D displays used for tomography.

The method of holography is based on reconstructing 3D objects using light recording. A hologram is created when an interference of several electromagnetic waves with equal frequencies occurs. The spreading of holographic 3D displays is wide in the artistic field, usually this process is combined with music and computer graphics.

SPACEX

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Space Exploration Technologies Corporation (SpaceX) is an American aerospace manufacturer and space transport services company with its headquarters in Hawthorne, California, USA. It was founded in 2002 by former PayPal entrepreneur and Tesla Motors CEO Elon Musk with the goal of creating the technologies to reduce space transportation costs and enable the colonization of Mars. It has developed the Falcon 1 and Falcon 9 launch vehicles, both of which were designed from conception to eventually become reusable, and the Dragon spacecraft which is flown into orbit by the Falcon 9 launch vehicle to supply the International Space Station (ISS) with cargo. A manned version of Dragon is in development.

SpaceX's achievements include the first privately funded, liquid-propellant rocket (Falcon 1) to reach orbit, in 2008; the first privately funded company to successfully launch, orbit and recover a spacecraft (Dragon), in 2010; and the first private company to send a spacecraft (Dragon) to the ISS, in 2012. The launch of SES-8, in 2013, was the first SpaceX delivery into geosynchronous orbit, while the launch of the Deep Space Climate Observatory (DSCOVR), in 2015, was the company's first delivery beyond Earth orbit. On December 21, 2015, SpaceX successfully returned a first stage back to the launch site and accomplished a vertical landing, the first such accomplishment by a rocket on an orbital trajectory.

NASA awarded the company a Commercial Orbital Transportation Services (COTS) contract in 2006, to design and demonstrate a launch system to resupply cargo to the International Space Station (ISS). SpaceX, as of May 2015 has flown six missions to the ISS under a cargo resupply contract. NASA also awarded SpaceX a contract in 2011 to develop and demonstrate a human-rated Dragon as part of its Commercial Crew Development (CCDev) program to transport crew to the ISS.

HIGH TECHNOLOGIES RULE THE WORLD

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Today, it is safe to say that high technologies rule the world. With these technologies we are marching forward to a better future What only yesterday seemed unattainable, today is already shaping the way of life and people's values: from high-speed aircraft to high-speed trains that save the time; from biomaterials to artificial hands; from digital libraries, online universities and courses to the advanced settings of deep drilling of the earth's crust. Thanks to information technologies we can meet people living far away in completely different countries and cities.

However, unfortunately, the level of understanding and using different technologies is not sufficiently high in our society nowadays. The lack of knowledge and awareness creates an ambiguous attitude towards them.

THE CARS WITHOUT DRIVERS

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We live in the information age when skills of finding and using information are more important than before. Every day scientists invent new technologies to make our life easier and safer. One of them is the car which works automatically without a driver.

German and American scientists proposed an idea of using the specific software which would operate cars and planes.Besides programs it also required special tools and equipment. They are radar and laser systems, GPS navigation and others.

Google and General Motors companies combined software and hardware and in 2008 started to test the first device. It wasn't a car, but it was like a robot with new navigation systems and new programs. Engineers created the first carafter several months testing. The car was able to go about 5000 kilometers without a stop what is very good for a special kind of drivers.

It was too difficult to create programs for the car. Google company improved a program code for scanning the road and the nearest objects. As a result new technology gives us possibility to observethe car vision. Programmers have also coded Traffic Laws.

A laser system scans the road and the nearest objects using lasers and detects everything not far. Radar system uses radio waves to detect different objects far from the car. Radar provides information about another carspeed and direction, traffic lightsignals and other things too. GPS makes the correct way.

The advantages are:possibility to run a car to long distances, much safer than a human driver, decreasing amount of crashing and accidents, using electricity instead of fuel.

The disadvantages are: price, requirement to update software regularly, impossibility to gain drive experience.

This technology helps people save their time, energy, health, life and develops human understanding of new fields of knowledge. For example USA improved this technology and created a plane without a pilot. Now the cars without drivers are used in such countries like Japan as a taxi and they will be everywhere soon.

PROSTHETIC NEWS

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I am sure all of us have heard about prosthetics. It is an artificial device to replace or augment a missing or impaired part of the body. And today I am going to tell you about creations in this area.

A generation ago, getting a prosthetic limb fitted usually amounted to a having a heavy, nearly useless hunk of plastic and metal tacked onto your body. But bionic hands just how quickly that's all changing. Among the hand's more impressive features are its ductile wrist and fingers.

Another example is cutting-edge prosthesis. They are amazing, but they lack one very important feature: a sense of touch. Now a research team from Stanford University has developed artificial skin that can sense force exerted by objects—and then transmit those sensory signals to brain cells.

A Japanese robot-maker showed off suits that a wearer can control just by thinking, as it said it was linking up with an industrial city promoting innovation.

And now, I will show you some especial creations in prosthesics.

One man lost part of his right arm in a freak accident, but he didn't want that to derail his dream of becoming a professional drummer. So he built a makeshift drumming device for his arm out of a brace and some springs. But a Georgia Institute of Technology engineer wanted to take things to the next level, by building Barnes robotic arm that would allow him to play just as well, or better, than any drummer.

There is a new 3D-Printed Hand, which could serve as scaffold for living tissue. The new artificial hand design has potential application in humanoid robotics as well as limb prosthetics. But even more intriguingly, the researchers suggest that — together with advances in neuroprosthetics and skin grafting — the design could be used as 3-D scaffolding for actual limb regeneration.

An adorable Husky named Derby was born with malformed front limbs. Luckily he came into the foster care of Tara Anderson, an employee of 3D Systems based in Rock Hill, S.C. The company specializes in design-to-manufacturing solutions for 3D printing and they decided to come up with a solution for Derby. Together, they created two prosthetic devices that conformed to Derby's forelegs.

3D COMPUTER GRAPHICS

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3D computer graphics (in contrast to 2D computer graphics) are graphics that utilize a three-dimensional representation of geometric data that is stored in the computer for the purposes of performing calculations and rendering 2D images.

Such images may be used for later display or for real-time viewing.

Despite these differences, 3D computer graphics rely on many of the same algorithms as 2D computer vector graphics in the wire frame model and 2D computer raster graphics in the final rendered display.

In computer graphics software, the distinction between 2D and 3D is occasionally blurred; 2D applications may use 3D techniques to achieve effects such as lighting, and primarily 3D may use 2D rendering techniques. 3D computer graphics are often referred to as 3D models. Apart from the rendered graphic, the model is contained within the graphical data file. However, there are differences.

The 3D model is the mathematical representation of any three-dimensional object (either inanimate or living).

The model is not technically a graphic until it is visually displayed.

Due to 3D printing, 3D models are not confined to virtual space.

The model can be displayed visually as a two-dimensional image through a process called 3D rendering, or it may be used in non-graphical computer simulations and calculations.

BRAIN-COMPUTER

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The development of different variants of the interface “brain-computer” (BCI) in recent years ceased to be an experimental direction and finds its practical application. What were the expectations like, what works now and what to expect from this technology in the future?

Methods of recording electrical activity of the brain were developed in 1929 by a German physiologist Hans Berger. Using the interface of “brain-computer” many research teams tried to regain the lost limbs or the ability to move in paralyzed people.

In each of these areas today, there are notable successes, but there are many difficulties in the practical application. The chief among them is the large size of the system, little time offline and multiple wired connections.

In the spring of 2013 they were able to solve many of these problems. The team of scientists managed to create the first wireless interface “brain-computer”. New BCI works from a rechargeable power source. It is differed by long-term use and reliability of signal transmission.

Wireless BCI implementation was successfully tested on pigs and monkeys for more than 13 months. The next step is testing on volunteers.

Electronic of new interface is placed in a hermetically sealed titanium case. It is powered by a lithium-ion battery with an inductive charging circuit. In the current version, the interface is used for one hundred pieces. Researchers have even found time to create and implant a miniature water cooling system for heating the device during charging, so that it did not cause discomfort.

Under another initiative researchers developed a more sophisticated version. It is used to control the motions of their hands called the interface control robotic manipulators “power of thought”.

In the future such application interface “brain-computer” will be able to improve the quality of life of thousands of people. Currently, all of these systems look very clumsy, but getting rid of the wires can significantly improve the usability.

FLYING CARS

Sovenko I., Sumy State University, group PM-51
EL adviser – Zolotova S. H.

Technology touches almost every part of our life today. Every day people invent new devices and improve old machines, and nowadays technology is fast-paced. So, there is one question, that people ask themselves : how will technology shape our life in the nearest future?

Scientists think, that technology will make our life easier. There are a lot of branches of science, that will appear in the future. One of them is a flying car. A flying car is a personal vehicle that provides door- to -door areal transportation. The flying car has been depicted in the science fiction novels such as Chitty Chitty Bang Bang , Harry Potter, Back to the Future and others.

We need flying cars nowadays greatly, because thousands people every day die on the road of our city, our country, our world, and there is only one reason for it : heavy traffic. When flying cars comes in our world , people will have not an a ground six-lanes roads, but they can have an a 6,7,8 and more air lanes, which will be able to help us to escape problems on the roads.

Today there are a lot of experiments all over the world, where people try to make a safety flying car. The most advanced real world flying car is Aero Mobil. Aero Mobil is a flying car that perfectly substitute the use of existing infrastructure created for automobiles and planes, and opens doors to real door-to-door travel. As a car it fits any standard of parking space, uses regular gasoline, and can be used on the roads just like any other car. As a plane, it can use any airport s in the world, but can also take off and land using any grass strip or paved surface just a few hundred meters long.

The current flying car prototype Aero Mobil 3.0 incorporates significant improvements and upgrades in comparison with the previous prototype Aero Mobil 2.5. It has been in regular flight-testing program under the real flight conditions since October 2014.

SWARM ROBOTICS

D. V. Taranova – Sumy State University, group FE-41
I. A. Morozova – E L Adviser

Collective behavior, exhibited by a large number of animals that have the same size and work together toward the one goal is called swarm behavior. This term is applied to insects, but can also be used to any other entity or animal. If we look on it wider, we will see that swarming is a collective motion of self-driven entities.

Using swarming is a new approach to coordinate a system that consists of many robots that are mostly simple. One robot interacts with environment and with other robots, causing collective behavior just as in the swarm of insects. It is supposed that simple individual algorithms can produce a complex set of swarm behavior.

Scientists that study swarm robotics, observe natural organisms, taking known facts about their behavior, and put the essence of it into algorithms. Such algorithms need sensors and actuators on robots and also communication between them to work.

The perfect robot swarm can be dropped anywhere and it will reprogram and reconfigure itself according to the situation and work to the target without information of the situation. It is a goal of swarm robotics.

Potential application for swarm robots is really huge. They will be excellent tools for exploring dangerous and unknown places. The most expected use is a disaster rescue operations. More controversial is that they can also be used to form an army in military. Artists may use swarm robots to their interactive art. Also these robots can interact with people so there is one extra application: toys and educating.

To sum it up, swarm robotics is a new way of coordination robots systems that is based on the behavior of natural swarms and may be used in many fields.

TOOLS FOR WEB DEVELOPERS

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CSS frameworks are pre-prepared software frameworks that are meant to allow for easier, more standards-compliant web design using the Cascading Style Sheets language. CSS frameworks offer different modules and tools, such as reset style sheet, grid especially for responsive web design, web typography, set of icons in sprites or icon fonts, styling for tooltips, buttons, elements of forms, etc.

Bootstrap is the most popular HTML, CSS, and JS framework for developing responsive, mobile projects on the web. Millions of amazing sites across the web are being built with Bootstrap. It's made by people of all skill levels, devices of all shapes, and projects of all sizes. It contains HTML- and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions.

You can build on the basic template above with Bootstrap's many components. We encourage you to customize and adapt Bootstrap to suit your individual project's needs.

Font Awesome is a font and icon toolkit based on CSS and LESS. It was made by Dave Gandy for use with the Twitter Bootstrap. Setting up Font Awesome can be as simple as adding two lines of code to your website, or you can be a pro and customize the LESS yourself.

The JSFromHell.com is a JavaScript code repository, maintained by Jonas Raoni Soares Silva and Carlos R. L. Rodrigues, having as objective supplying small and quality codes. Our codes were tested on the newest versions of the browsers: Firefox, Opera and Internet Explorer.

- Math Parser - mathematical expression parser.
- Data Slider - auto rotates through objects.
- Big number - offers an extremely high precision level to make mathematical operations. For integers there is no limits and for floating point numbers, the class allows setting the maximum precision.

3D BIOPRINTING IN BIOTECHNOLOGY

D. Yurchenko – Sumy State University, group FE – 41
I.A. Morozova – Adviser

I am sure all of us have heard about 3D printers. They can print plastic models with different shapes and structures. And today I am going to show you, how we can use them in medicine and biotechnology.

Researchers in the U.S. have managed to invent a 3D printer capable of churning out human-scale, living tissues that survived and integrated when implanted into an animal. While it is still early days, the team demonstrated that the tissues developed the right strength and function required for human application, raising the possibility that the technique could one day be used to help people whose tissue has been damaged by disease or trauma.

Researchers are increasingly looking towards 3D printing in regenerative medicine because of the ease and precision it offers for creating an array of complex structures that can be tailored to the patient. It's already possible to 3D print solid objects that can be used to replace bones. One woman even received a plastic skull. Unlike real organs, a lack of blood vessels to keep the inner cells happy imposes a size limit that essentially means the tissues can never be made big enough to be clinically relevant.

On top of that, problems with structural integrity mean that the printed tissues are often too flimsy to survive after being implanted. But the group from the Wake Forest Baptist Medical Center might have come up with a way to overcome these issues. Describing their developments in the paper, the researchers bestowed their tissues with mechanical stability by printing patterns of live cells in a mix that contained biodegradable, plastic-like materials. These were designed to dissolve in the body after the construct has

had enough time to grow and mature into a structure capable of retaining its shape.

To help keep the cells alive, the team printed a network of tiny channels throughout the structure which allowed the flow of oxygen and nutrients until blood vessels can work their way in post-implantation and offer their own supply. This was demonstrated after they inserted a human-sized ear, made by printing cartilage cells into a design dictated by a CT scan, under the skin of mice. Two months after the surgery, the structures had maintained their shape, matured into cartilage tissue, and showed signs of vascularization.

In another proof-of-concept experiment, the team printed rat muscle cells into supportive structures and left them to grow for a week before implanting them into rats. Amazingly, after just two weeks the construct had matured and developed organized muscle fibers which made contacts with nerves, an essential feature if the tissue is going to gain any functionality. Indeed, electrically stimulating the muscle caused it to respond and fire up neighboring neurons to roughly the same extent that would be expected for immature muscle.

In February 2016 the thyroid gland was printed on the Russian 3D-printers cluster by Biological and Medical Technology Fund "Skolkovo", implanted and now successfully operate in body of the laboratory mouse.

Longer-term studies are needed to investigate the lifespan of these structures, but the work is encouraging nonetheless, and as a patient’s own cells could be used, the common issue of rejection would be negated

TECHNOLOGY OF DATA TRANSFER IN WIRELESS SENSOR NETWORKS

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It has been over a decade since then, when we started intensive scientific and technological research of possibilities of using sensors together with the wireless network. The result was the creation of new types of telecommunications networks, wireless sensor networks (WSN) is a new promising technology, which are applied and executed large-scale projects for different industries and military systems.

Intense development of microelectronics has allowed to solve the problem of creating cheap, low consumable, multi-function devices having small dimensions and capable of transmitting telemetric information via radio over short distances. They have become basic elements in the structure of wireless sensor networks - new class of wireless systems that are distributed, self-organized and resilient to failure of individual elements of a network of tiny electronic devices (sensors) with independent power sources. The network nodes are able to relay information using multiple low-powered transmitters and providing a significant coverage area of the wireless system. A distinctive feature of the sensors is a miniature size and low cost, which allows their use in large quantities to create a network of collection and wireless transmission of telemetry data. In this case, the data transfer happens in stages, from one device to another, and the transmission routes are generated automatically

Among the main functional and operational benefits of the WSN should be allocated: loading and self-healing networks; scalable networks with dense placement of nodes in space (from dozens to thousands of devices); high reliability and fault tolerance at the expense of communications redundancy and availability of many alternative routes of delivery of data; low cost and small weight and dimensions parameters of the nodes; high energy efficiency (service life can reach several years with Autonomous power supply units); resistance to the modification of the network topology and changes in the characteristics of the medium of propagation of radio waves; the ability of nodes to jointly process received data and make decisions based on algorithms.

SECTION 2 ECOLOGYCALLY SAFER ENVIRONMENT

SUPERCAPACITORS COULD BE KEY TO A GREEN ENERGY FUTURE

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V. V. Havrilova – EL Adviser

Nowadays there are innovations that bring benefits in terms of reducing the energy consumption and of protecting the natural environment, the atmosphere people live. One of them is a supercapacitor also known as ultracapacitor or double-layer capacitor, is a high-capacity electrochemical capacitor with capacitance values much higher than other capacitors (but lower voltage limits) that bridge the gap between electrolytic capacitors and rechargeable batteries.

It is technically possible to use supercapacitor instead of lithium-ion batteries in cell phones, with some serious benefits: people never have to replace the supercapacitor and the phone would recharge very quickly (even if it does not stay charged for very long). For the moment, the supercapacitor may be effective at accepting or delivering a sudden flow of energy when connected to lithium-ion batteries in an electric car, where an supercapacitor could provide the power needed for acceleration while a battery provides range and recharges the supercapacitor between surges. A capacitor stores energy by means of a static charge as opposed to an electrochemical reaction and applying a voltage differential on the positive and negative plate charges the capacitor.

Supercapacitors have the following advantages:

- High power density. According to test by the Institute of Transportation Studies, Davis, California USA, the specific power of electric double-layer capacitors can exceed 6 kW/kg at 95% efficiency;
- Very low cost per Farad – unit of capacitance;
- Long lifetime, which reduces maintenance costs; they lose about 80% of their storage capacity after 10 years, with a lifetime estimated to be 20 years;
- Can be charged and discharged almost an unlimited number of times – certainly millions;

- Can discharge in matters of milliseconds or as long as tens of seconds or several minutes;
- Can be charged in seconds to minutes – far faster than most batteries;
- Do not release any thermal heat during discharge;
- High efficiency – 97-98%;
- Improved safety over batteries and electrolytic capacitors. For example, there is no danger of overcharging; when fully charged it simply stops accepting a charge and reversing polarity will not cause fire or explosion;
- Not affected by deep discharges as are chemical batteries;
- Operating temperature range can be -50C to 85C. Capacity increases as temperature decreases below the rating temperature, unlike a battery;
- They do not release any hazardous substances that can damage the environment;
- No disposable parts during the whole operating life of the device, which makes the device environmentally friendly unlike many batteries;
- At end of life, there are no hazardous materials for disposal unlike many batteries.

Supercapacitors have the following disadvantages:

- High cost ;
- Low energy density;
- High self-discharge the rate is considerably higher than that of an electrochemical battery;
- Linear voltage versus charge. As a capacitor discharges, its voltage decreases to 0V (chemical batteries have much more stable output voltages, for example lithium ion batteries run from about 3-4V).

The supercapacitors are used in different activity areas: renewable energy, public sector, medicine, military, etc. They are important for the future. Supercapacitors are a key of engineering because they provide an economical, quiet and pollution-free alternative to diesel terminal tractors.

ECOLOGIZATION AS A PART OF SUSTAINABLE DEVELOPMENT

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N.V. Maliovana – E L Advisor

In the last decades, with a threat of global ecological crisis, there is a fast penetration of ideas of a sustainable development into economy, policy, sociology. This process of penetration of ideas and environmental problems in other fields of knowledge and practicians has received the name "greening". In a general sense, greening is a distribution of the ecological principles that approaches natural and human sciences, production and social phenomena [1].

Greening the economy is a necessary condition and the main component of the transition to the sustainable development, which promotes satisfaction of the requirements of the present, but doesn't threaten interests and requirements of future generations at the same time (the definition was accepted in 1992 at the Brazilian summit) [2]. Greening the economy is followed by the shift of the center of the economic analysis for expenses and intermediate results influenced the final results of economic activity and further the predicted development tendencies. In fact, it means greening of all social and economic structure and the development of the society and a transition to a new type of economy - economy of the sustainable development.

It is necessary to concentrate on such directions of formation of conditions of the sustainable development of the present state of the country [3]:

- realization of an integrated approach to formation of policy of the state in economic, ecological and social spheres;
- unity of the economic and ecological elements of social and economic reforms;
- introduction of integrated indicators of the sustainable development of Ukraine.

The problem of the greening the economy is very actual in a section of equivalence of an exchange between the state, the nature and the person that is based on legislative, organizational, technical solutions. This problem at the present stage is of great importance. It

has been created during two centuries and now has got the crucial value. Therefore, there is an objective need for the intervention of the state to the natural and ecological sphere for the purpose of achievement of the balanced state, it also has the foundation of global ecological and economic partnership between business and foreign partners at the level of planetary cooperation in order to survive and for further development of Ukraine, and the whole civilization [4].

For the solution of a problem of greening the economy, there are the main actions [5]. The important modern direction of greening is utilization, that is a reuse of waste. Another action is a regeneration of primary waste, which is left in a production cycle for the purpose of additional processing and extraction of unused elements or connections and three other ways of directions:

- return of waste to the same production from which it is received;
- use of waste in other productions;
- use in the form of raw materials for other productions.

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WITH NEW TECHNOLOGIES IN A CLEAN FUTURE

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I. A. Morozova – ELA

Nowadays, we have a lot of problems dealt with environment. A lot of plants, factories and cars all over the world throw harmful substances into the air every day. Many countries use alternative sources of energy, like hydro, solar, wind energy instead of old one, that pollute our nature.

Today, in time of great inventions and discoveries, scientists develop new kinds cars that have an electric engine. An example is an American automotive and energy storage company that designs, manufactures, and sells luxury electric cars, electric vehicle, powertrain components, and battery products. As you know, it is called Tesla Motors. It was incorporated in July 2003 by Martin Eberhard and Marc Tarpenning.

This company solves the problem of exhaust gases that damage our environment. And due to outstanding scientists, Tesla Cars will not pollute our nature. As it was mentioned before, these cars use an electric engine that converts electrical energy into mechanical energy. Tesla uses three-phase asynchronous electric motor with AC (variable) voltage. Unlike some other motors that use permanent magnets, this motor is based on the magnetic field, created by the electricity.

Despite of rather small size of this engine (22 centimetres in size) light weight (about 68 kilograms) and the total weight of power unit (with rotor and inverter) is about 136 kilograms, its horsepower is 416, it can develop about 16 000 revolutions per minute, and the maximum speed of it is about 210 kilometres per hour.

Unfortunately, such engine its disadvantages. First of all, you should charge the batteries very often, depending on the type of batteries you use, they must be replaced every 3-10 years, and they are very expensive in maintenance.

There is an interesting thing about the engine of the Tesla Motors – it is not patented. It means that you can use their technologies and make something new or develop their ideas.

So, technology grows quickly, and, it gives us the chance to think, that in future we will not worry about such problems as pollution.

UKRAINIAN MINERAL RESOURCES

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O.R. Gladchenko, EL Adviser

Ukraine is very rich in mineral resources. It contains iron and manganese ores, natural gas, salt, sulphur, graphite, flux limestone. Ukraine also has deposits of oil, bauxite as well as black coal. Mineral resources can be classified into three main groups: fuels, metals and nonmetals. Fuels include deposits of black and brown coal, natural gas and peat. The reserves of black coal are concentrated in two basins: the Donets and Lviv-Volynian Basins, deposits of brown coal are to be found in many places on the Right Bank. They form the large Dnieper Brown Coal Basin. The western regions of Ukraine contain small deposits of brown coal. Brown coal is used as local fuel for power stations, factories and plants, also in household heating.

Three oil and natural gas regions have been discovered in Ukraine: the Subcarpathian, Dnieper-Donets and the Black Sea regions. The most promising deposit of oil in Western Ukraine is the Dolyna field. In the Dnieper-Donets Region the largest gas fields are in Kharkiv region. Gas deposits have been also discovered in Sumy, Poltava and Dnipropetrovsk regions. The Black Sea region encompasses the southern part of Zaporizhia and Kherson regions as well as the northern part of the Crimea.

Peat has been used in Ukraine for a long time. Its extraction has been greatly increased and it is important local fuel in industry: it is also widely used as an organic fertilizer. The greatest deposits of peat are in Polissia, but it is also to be found in marshy river valleys. Ukraine is rich in deposits of iron, manganese, mercury, titanium and other ores. The deposits of iron ore are one of the largest in the world. They are concentrated in Kryvy Rih, Kerch, Kremenchuk and Bilozerka. Ukraine is one of the richest places in the world for

reserves of manganese ore which is used in the manufacture of high-quality steel. Several deposits are located within Dnipropetrovsk and Zaporizhzhia regions.

Titanium is important in the space, chemical, atomic and other areas. It has been discovered in Dnipropetrovsk region. Mercury is obtained from cinnabar, the largest deposit being the Mykytivsky field in Donetsk region. Ukraine has inexhaustible reserves of raw material for the production of the magnesium, which is obtained from the rich brine of Syvash Bay. Ukraine has also deposits of bauxite, nickel, cadmium, bismuth, arsenic and antimony.

Ukraine's depths are rich in non-metallic minerals, which are widely used in the national economy. The important ones among them are rock and potassium salts, sulphur, fire clay and building materials. The largest deposits of rock salt are centered in the Donbas and in Solotvyno in Transcarpathia, Subcarpathia has deposits of potassium salts (Kalush) and the largest deposit of native sulphur (Rozdolske). The main deposit of fire clay is in the Donbas (Chasovoyarsk). Large reserves of red and grey granite, chalk, marl are also found in Ukraine. There are many curative mineral waters in Ukraine.

GREEN TECHNOLOGIES AND THE PROBLEMS OF THEIR IMPLEMENTATION IN UKRAINE

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We can hear much information about green technologies nowadays. But what do this words mean? The concept of green technology means the use of renewable sources of energy and materials.

There are two main directions of development of green technologies : green energy and green transport. There is also a term "green house", but it concerns to energy production and energy saving.

We know three most wide-spread kinds of green energy: hydroenergy, wind energy and solar energy. How can we produce electric energy using water? There are a few ways of it. We can use energy of falling water, energy of sea waves and energy of sea tides. These kinds of production electric energy are used only in industrial scale, because electric hydrogenerators are really huge.

Wind energy can be used for production of electric and mechanical energy, but the most wide-spread is production of wind electric energy. The main advantage of wind energy is production of electricity not only in industrial scale, but in houses too. There are many kinds of wind electric generators: small, big, huge, vertical, horizontal and so on. The main disadvantage of wind energy is instability. Ground wind is gusty and changeable and this does not allow to produce electricity all the time. But there is a solution to these problems. Electrogenerator aerostat can be used on height to 600 meters where wind is constant and powerful. But these generators are huge too.

Solar energy can be used for industrial production of electricity and water heating for houses. There are solar collectors for water heating which can be installed on the roof of the house or on the ground. We have two ways of electricity production using solar energy. The first is photoelectric panels. It is good for private houses and offices, but it is very expensive. The second is a reflector power

station which uses mirrors for collection of sun rays in reactor for production of electric energy. This way is only for industrial production, because for building power station we need huge area for mirrors. There must be thousands of mirrors.

What do we know about green transport? There are many kinds of green cars: electric cars, hybrid cars, solar cars, even electric sport cars. But these are all new kinds of transport. What should we do with 900 million cars in the world which use engines of internal combustion. The solution is green fuel. Palm, sunflower, corn, soybean and rape oil can be used in diesel engines. Petrol engines can use alcohol and biogas.

What is the situation with green technologies in Ukraine? We have not places in our country where wind is constant and powerful, the sun shines in Ukraine less than half of the year and we have not huge sea tides. New kinds of green transport are too expensive for Ukrainians. Even electric cars will not be ecologically friendly in Ukraine. The main part of Ukrainian electric energy is produced by nuclear energy and energy of fossil fuel. How can an electric car be green if it uses dirty energy for charging? So, what can we do? How to build green Ukrainian economy?

In the south of Ukraine we can use energy of sea waves for electricity production. In other regions electric generator aerostats can solve energy problems. Production of biodiesel exhausts our land, but thousands of restaurants and cafes produce more than million liters of used sunflower oil which can be used as a fuel for urban transport. Every private house can install solar collectors for heating. That is the correct way for our development.

LET'S CLEAN THE OCEAN!

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The ocean remains one of the most expansive, mysterious and diverse places on Earth. Unfortunately, it is being threatened by pollution from people on land and from natural causes. Marine life is dying, and as a result the whole oceanic ecosystem is threatened simply by various sources of pollution. If we are to preserve ocean and its natural beauty, drastic measures have to be taken to combat this pollution and keep what we hold most dear. Could a teenager save the world's oceans?

Student, 19, claims his invention could clean up the seas in just five years. Boyan Slat came up with the idea of a series of floating booms and processing platforms designed to 'suck' in floating plastic rubbish. Device could remove 20 billion tonnes of plastic from the world's oceans. His invention could even make money by selling the plastic collected from the oceans, which kills millions of animals every year. The device consists of an anchored network of floating booms and processing platforms that could be dispatched to garbage patches around the world. Instead of moving through the ocean, the array would span the radius of a garbage patch, acting as a giant funnel. The angle of the booms would force plastic in the direction of the platforms, where it would be separated from plankton, filtered and stored for recycling.

It is estimated that the clean-up process would take about five years, and it could greatly increase awareness about the world's plastic garbage patches. On his site Slat says, "One of the problems with preventive work is that there isn't any imagery of these 'garbage patches', because the debris is dispersed over millions of square kilometres. By placing our arrays however, it will accumulate along the booms, making it suddenly possible to actually visualize the oceanic garbage patches. We need to stress the importance of recycling, and reducing our consumption of plastic packaging."

GREEN ECONOMY

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A number of financial problems, problems with product management, fuel and climate have happened recently in the world. In the last few decades 60% of the world's ecosystems have suffered degradation, emissions of carbon dioxide reached 40%, there is a significant shortage of water resources, a billion people are hungry and two billion people live on less than $ 2 a day.

In 2008, in response to the financial and economic crisis the United Nations Environment Program announced the transition to a "green economy" that should help restore the global economy. UN calls to draw maximum attention to five major areas:

- energy building;
- transition to renewable energy, including wind, solar, geothermal and biomass energy;
- sustainable development of transport;
- ecological infrastructure of the planet, including fresh water, forests, soils and coral reefs;
- development of sustainable agriculture, including organic production.

Let us consider the development of alternative energy in Ukraine.

One of the most promising areas of renewable energy is biomass. Materials such as waste of agriculture, wood processing and forestry would save 20-30% of today's consumption of gas.

The next area of alternative energy is wind energy. According to Global wind energy council about 40% of areas are suitable for generating energy from wind. The highest wind energy potential is observed at the Black and Azov Sea, the southern coast of Crimea, the top Ukrainian Carpathians, Crimean mountains and the Donbass region.

The next area is solar power in Ukraine. The whole territory of Ukraine is suitable for heating systems using solar energy. The most promising region of the country for the development of solar energy is Steppe Ukraine.

Geothermal energy in Ukraine has considerable potential resources. Areas of possible use are Crimea, Transcarpathians,

Carpathians, Donetsk, Poltava, Kharkiv, Kherson and Chernihiv regions. Hot water, steam and natural mixture of steam can have the best saving potential.

Everyone should feel his responsibility for the environment and our future.

THE STUDY AND ANALYSIS OF VARIOUS WATER PURIFICATION METHODS

D. Vasylchenko – Sumy State University, group I-42
I. A. Morozova – E L Adviser

Water has always been an important and life-sustaining drink to humans and is essential for the survival of all known organisms. Though water is available in plenty, in the present day scenario availability of pure drinking water has become a rare commodity that is attributed to a number of known reasons.

One of the most persistent problems affecting people throughout the world is insufficient access to clean water and sanitation. Each year, around 3.6 million people die because of issues related to contaminated water, poor hygiene, and unsanitary conditions. If those households, most at risk could gain access to safe drinking water, more than 2 million lives could be saved.

Thus, we see that our health and our life depend on the purity of drinking water. But how exactly can contaminated water affect the deterioration of our health? Some of the effects of drinking contaminated water can be immediate, or not noticed for many years. These include gastrointestinal and stomach illnesses like: nausea, vomiting, cramps, diarrhea. Many factors affect the possible impact on health such as: the age and general health state of the person, the type of contaminant, the amount, how long the person has been drinking the contaminated water.

Problems with water are expected to get worse in the coming decades, due to the impact of growing industrialisation and urbanisation. It will lead to water scarcity globally, even in regions currently considered water-rich. To address these problems tremendous amount of research has to be conducted in identifying robust new methods of purifying water at lower cost and with less

energy, while at the same time minimizing the use of chemicals and impact on the environment.

Due to greater chances of water contamination in the supply systems, the US Environmental Protection Agency (EPA) is evaluating the use of a number of centralized water treatment concepts as „small system compliance technology" (USEPA, 1998). These include package treatment plants (i.e., factory assembled compact and ready to use water treatment systems), point-of-entry (POE) and point-of-use (POU) treatment units designed to process small amounts of water entering a given unit (e.g. building, office, household, etc.) or a specific tap/faucet within the unit.

Purification of water involves the removal of parasites, bacteria, algae, viruses, fungi, minerals (including toxic metals such as lead, copper, arsenic etc.), and man-made chemical pollutants. Many contaminants can be dangerous, but depending on the quality standards, others are removed to improve the smell, taste, and appearance of water.

According to the North Carolina Cooperative Extension Service, there are four types of contaminants that can enter your drinking supply: microbial pathogens like salmonella and dysentery, organic compounds like pesticides and solvents, inorganic compounds like arsenic and lead, and radioactive elements like radon.

In my work a review of various purification methods is presented beginning with the conventional methods like activated carbon, activated alumina, silica, diatomaceous earth etc. to the latest techniques using nanomaterials, carbon nanotubes and nanocomposites. Break through techniques like thin films, quantum dots and aerogels in the purification of drinking water are mentioned. As each method has its own advantages and limitations in terms of removing contaminants, efficiency and cost effectiveness a blend of techniques is considered to be more beneficial than using a single technique.

So the topic is important and relevant nowadays, as our health and life depend directly on the water, we drink, and water treatment is a vital process to protect our body from pollutants

SECTION 3 ADVANCEMENTS IN MEDICINE

DURATION OF PREHOSPITAL ASSISTANCE TO VICTIMS WITH TRAUMATIC INJURIES IN RURAL AREAS

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Emergency aid – one of the most important parts of a unified system of care to the population of our country.

We know that there is a direct correlation between the severity of traumatic injuries and timely arrival of medical personnel to the affected.

According to the Law of Ukraine "On emergency medical assistance" of the Cabinet of Ministers of Ukraine of 11.12.2012 № 1119 g., defined standards arrival of ambulance crews at the scene: in cities - up to 10 minutes in rural areas - up to 20 minutes after receipt of an appeal to fellow operative-dispatcher. Given the state of the road surface and weather conditions, these ratios may be exceeded, but no more than 10 minutes.

In traditional agricultural Sumy region, we decided to find out how to set limits performed emergency conditions in rural areas and eventually study to identify ways to further improve the system of providing pre-hospital care to victims of mechanical trauma.

The studies were conducted in compliance with ethical norms and the principles of the Helsinki Declaration, the Convention of the Council of Europe and the relevant laws of Ukraine on human rights. All calculations and data analysis were carried out on the criteria and requirements of evidence-based medicine, provisions and conclusions are within probabilities.

We reviewed the work circuit "Department emergency ambulance of the Bilopillya", which serves the city of regional importance and 53 villages. The urban population of 18200 people,

rural population – 9680 people (total – 27,880 people.). Radius service averages 17,7 + 1,01 km, the distance to the most remote areas – 36 km. For 9 months of 2015 was carried out 46 visits to the villagers with traumatic injury.

As a result of the research we found that the average time from decision to call dispatcher arrival ambulances to affected the rural is – 21,87 + 0,95 min., and the average length of prehospital period – 55,78 + 2,46 min.

The share of calls that exceed standards set time – 15,22%.

Among the main reasons for delivery victim of traumatic injuries in hospitals with a delay exceeding the approved standards, we have identified:

– the distance to the victim – 4,35%;

– the poor state of the road surface – 4,35%;

– need for antishock measures (immobilization, analgesia, establishment of intravenous access) on the spot – 2,17%;

– bad weather conditions (ice, snow) or dark time of the day – 2,17%;

– other reasons – 2,17%.

Conclusion:

Disadvantages evacuation of injured and transport provision recorded in 15.22% of cases. Distance to the victim and the poor state of the road surface – one of the main reasons for delays in the arrival of coach ambulance.

FROM THE HISTORY OF MRDICINE IN NIGERIA

Bennibor Onisokien Blessed – Sumy State University, group LS-519
G.S. Ilyina – EL Adviser

Nigeria is a large country with diverse cultures and traditions. About 250 linguistic groups, of which 3 are major groups comprise over 60% of the total population. Each group evolved its own micro-culture and micro-traditions. Traditional medicine and healing constituted part of micro-cultural evolution. Traditional healing and medical practices included herbalists, divine healers, midwives, bone-setters, mental health therapists and surgeons. In rural areas where 70% of population live people rely on traditional health care system because it available, accessible and affordable to them. The first record of modern medical services in Nigeria was during the various European expeditions in the early-to-mid 19th century.

The emergence of organized health care services

It was the church missionaries that first established health care services for the people. The first Heart Hospital was built in 1895 by the Roman Catholic Mission. The facilities built by different Missions were of such high quality that they became the nucleus of the teaching Hospital complex of a major university in Nigeria.

Medicine during the struggle for Independence

During that period health care was oriented primarily to curative rather than preventive care. For example, as a result of the poor attempt to established preventive programs, measles remained the greatest killer of children. By that time, the WHO had proven that proper execution of preventive programs can eradicate deadly diseases, and indeed, small pox is almost non-existent in Nigeria.

Medicine in Nigeria today

Nigeria's health care faces many problems and their solution is in the hands of doctors. Doctors are organized under the umbrella of the Nigerian medical Association (NMA). It is one of the most respected civil organizations in Nigeria. It is composed of 35,000 doctors.

BIOPRINTER

M. Bezdidko – Sumy State University, group: IT-32
S.G.Zolotova – E L Adviser

Printer is a peripheral which makes a persistent human readable representation of graphics or text on paper or similar physical media.

At last the bioprinter has been created. The printer that costs $200,000 has been developed as a result of cooperation between two companies: Organovo and Invetech. First working samples of the printer soon will be delivered to yhe research groups. They will explore the ways to create artificial tissues and organs.

According to Keith Murphy (manager Organovo), only simple tissues will be created at the beginning, such as skin, muscles and small areas of blood vessels. But, only after completing the tests with sample printer people will be able to produce more complex organs.

Surgeons who are engaged in human organ transplantation, hope that one day they will be able to receive all the necessary organs for transplantation on the first request. Now the patient can spend a few months, and even years waiting for a suitable organ. During this time he can get worse. Even he may die. Thanks to artificial organs could not only alleviate the suffering of patients, but also save their lives. Now, with the advent of the first commercial 3D bioprinter this possibility can become a reality.

Despite the fact that industry of printing human organs is in its infancy, scientists can already show successful examples of the creation of human organs “from scratch”. So, in 2006 Anthony Atala and his colleagues from Wake Forest Institute for Regenerative Medicine in North Carolina, USA, created bladders for seven patients. All of them are still functioning.

In the nearest future we will see printed liver, kidney and heart. Some researchers believe that a machine like this, will be able to print tissues and organs directly into the human body.

POPULATION FREQUENCY OF SOME HUMAN MONOGENIC TRAITS AND THEIR CONNECTION WITH SEPARATE INHERITED DISEASES

I.Chernetsky – Sumy State University, group LS-402
N.G. Horobchenko – EL Adviser

The subject of the study is aimed to identify some relationships between diseases and their genetic and associated traits and to research some monogenic traits distribution in the society. Quite a lot of human morphological traits are monogenic and genetic. Among them there are eye fissure types, color of eyes, hair color, ear shape, the shape of lips, teeth, nails, nose, chin, tongue and so on. The study of monogenic traits is the target of this paper. The objects of the research have become residents of Ukraine and most of them are the students of Sumy State University. The main methods of the research are questionnaire survey and comparison of the obtained results with the literary sources. Statistical analysis of the data has been performed using the method $\chi 2$. This method is proved to be quite accurate and so there have not been found any common factors of the traits depending on the sex.

101 people have been examined (57 women and 44 men), 98% of them are Ukrainians. 61% of the examined people are able to roll the tongue (59.6% of women and 63.6% of men). It corresponds with the data that about 64% of Europeans can roll the tongue. This trait is considered to be dominant, though some of the researchers have found out the cases of discordance of this trait among the monozygotic twins. About 10.9% of the examined people have attached earlobe, equally among men and women. Hyperextension of fingers has been found in about 68% of the examined people (71.9% of women and 62.8% of men). Among the examined people 4.95% have got red hair (in spite of the sex), 31% - dimples on the cheeks (40% of women and 18.6% of men) and 28.7% - dimple on the chin (26.3% of women and 31.8% of men) and 30.7% of them have diastema – (29.8% of women and 31.8% of men).

The obtained results can be used as the control ones for the future investigations devoted to the determination of the connection between morphological features which have been studied and some

of the diseases. Despite the fact that appearance of the studied traits is within the acceptable medium static rules, certain complex combinations of the studied traits can indicate some possible pathologies. Monogenic diseases are caused by the mutation of one gene. So the disease development is connected with the product of one gene (absence of the protein, biocatalyst or its abnormal structure). The traces of many diseases can be found in the sick people appearance. For example, inability to roll the tongue, attached earlobe, red hair, blood type and some others are considered to be additional prognostic features of the coronary heart disease development; the ability to bend the tongue, hyperextension of fingers and attached earlobes are some of the signs of connective tissue dysplasia which is caused by a defect in the structure, production, or processing of collagen.

The color of the eyes can speak of our diseases, too. Grey iris may indicate the presence of a uveitis, and those with lighter iris color have a higher prevalence of age-related macular degeneration. Yellowing of the sclera is associated with jaundice, and may be symptomatic of liver diseases. Rare genetic Wilson's disease can be identified by dark rings that encircle the periphery of the iris, which are formed because of accumulation of copper in it. Premature graying is the sign of Werner syndrome or pernicious anemia which is proved by many investigations. People having albinism which is accompanied with very fair hair, skin and transparent blue eyes are inclined to have photophobia, nystagmus, amblyopia and skin cancer.

At present there is an innovational idea of developing the program which is able to recognize human faces and their morphological traits at the highest level and then to correspond these traits with certain diseases.

The presented research paper can be used by the future doctors for diagnosing the genetic diseases by person's appearance and for the young parents to understand the mechanisms of monogenic traits transmission. The obtained results can also be used as the control ones for the further research devoted to the determination of the connection between morphologic traits that have been studied and some diseases.

MEDICINE IN AFGANISTAN

Elham Nazbar – Sumy State University, group LS- 521
G.S. Ilyina – EL Adviser

Over the decades of war and civil strife the network of public service delivery had been disrupted. There are many barriers to create an accessible effective sustainable health care system in Afghanistan. They include severely damaged health infrastructure, economic hardship, difficult access to health care facilities, unsuitable hospital conditions, and few trained care workers, especially women.

But over the last decade Afghanistan' health sector made significant progress, which translated in substantial decline of infant, child and maternal mortality. The coverage of primary health care services has been expanded to districts where 82% of population resides. Afghanistan has made progress in combating polio. In 2011 the Ministry Public Health launched the strategy "to improve the health and nutritional status of the people of Afghanistan through the quality health care services provision...". Today, strong collaboration between Afghanistan Government and international non-governmental organizations contributes much to the development of modern health care system. E.g. US Agency for International Development (USAID) provides the essential help throughout the country. One million people are treated at USAID. They train health workers. The number of midwives increased from 476 during Taliban rule to about 4,000 today. During this period many private and non–private hospitals and clinics are built only in the case to be equipped with technology of the day. The country has bought 1.2 billion US dollars 50 X-ray machines, 50 Electrocardiogram machines and other surgical and diagnostic instruments which made

Afghanistan to have a higher place in medical ranking in Asia.

METHODS FOR DETERMINING THE HOMOGENITY OF AORTIC WALL CALCIFICATIONS

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N.G. Horobchenko – EL Adviser

Cardiovascular diseases in Ukraine amount to 65.8% of deaths. The part of their prevalence and incidence in the structure of diseases among the population is 31.5% and 7.4%, but it reaches 52.1% and 20% among people of retirement age. Cardiovascular diseases include myocardial infarction, stroke, and aneurysm of vessels. Calcified plaques on artery walls that prevent normal blood supply of the myocardium and brain are the most common causes of heart attack and stroke. Calcification of vessels may cause their aneurism. In particular, the presence of abdominal aortic aneurism during a year can be a cause of a sudden death. That's why the study of the research methods of calcifications, their composition and the process of depositing in the wall of blood vessels are topical.

The objective of the research is to find out the features of location of the calcified deposits in the walls of the aorta and the extent of its heterogeneity. The study of the extent of homogeneity of the calcification of vessels' membrane was held with the use of gravimetric weighing of the samples dried under the following temperatures: 18°C, 40°C, and 100°C. Each sample was divided into four parts. Each part of calcified aorta was weighed after drying at thermostat. The selected temperature range allows determining the mass fraction of free water with different bind force. To determine the extent of homogeneity the following formula was used: $H=\Sigma(|x-\bar{x}ni=1|)$; where H stands for the extent of heterogeneity, x stands for the percent of water loss in the sample, $\bar{x}$ stands for the arithmetical mean of the percent of water loss in all samples.

The research showed that the average water content was 67%. The extents of heterogeneity 14.2 and 7 show that calcified aorta loses water irregularly. Accordingly, the first part of the sample was more calcified than the others. This is confirmed by the amount of evaporation of water data: in the first sample it constitutes the smallest part – 52%, when in the other two samples it constitutes 69% and 75% resp. The data about the water fractions part show that the pathological bioapatite is unequally distributed in the walls of a vessel.

The following method of studying the homogeneity of pathological biomineral can help to determine the mechanism of depositing of calcificates in the walls of vessels, and that will be a step forward to finding an effective method of diagnosis and treatment of vascular calcification

SINGLE NUCLEOTIDE POLYMORPHISM DETERMINATION BY PCR METHOD IN ORDER TO OPTIMIZE THE DOSING OF ORAL ANTICOAGULANTS

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The polymerase chain reaction (PCR) is a technology in molecular biology used to amplify a single copy or a few copies of a piece of DNA across several orders of magnitude, generating thousands to millions of copies of a particular DNA sequence. Nowadays scientists widely use PCR method to identify single nucleotide polymorphisms (SNP). SNP is a variation in a single nucleotide that occurs at a specific position in the genome, where each variation is present to some appreciable degree within a population. Such variations may fall within coding sequences of genes, non-coding regions of genes, or in the intergenic regions, and in this way they may influence the qualitative or quantitative characteristics of the mature proteins. SNPs in the DNA sequences of humans can affect how humans develop diseases and respond to pathogens, chemicals, drugs, vaccines, and other agents. SNPs are also critical for personalized medicine.

Each year, millions of people take warfarin and other coumarins, which together form the group of oral anticoagulants. Although these vitamin K antagonists are remarkably effective at preventing cardioembolic stroke, myocardial infarction, and venous thrombosis, they double the incidence of hemorrhage. The hemorrhage risk is greatest during the first weeks to months of therapy. To reduce this risk, experts advocate prescribing the anticipated therapeutic dose to patients who are beginning warfarin, but until now there was no accurate way to estimate that dose. By using pharmacogenetics-based warfarin therapy, clinicians can now

estimate the therapeutic warfarin dose by genotyping their patients for single nucleotide polymorphisms that affect warfarin metabolism or sensitivity. The objective of pharmacogenetics-based coumarin therapy is to improve the safety and the effectiveness of anticoagulant therapy.

The main place among the many genes that are related to the action and metabolism of oral anticoagulants takes vitamin K epoxide reductase complex subunit 1 (VKORC1), which is the molecular target of coumarin-based anticoagulants. VKORC1 is a key enzyme in recycling reduced vitamin K, plays an essential role in post-translational modification and activation of vitamin K-dependent coagulation factors. Since the cloning of VKORC1 in 2004, frequent VKORC1 single nucleotide polymorphisms and haplotypes have been consistently associated with warfarin dose required to therapeutic anticoagulation. Specifically, 5 SNPs define 2 major haplotypes in Europeans rs719616114 (T381C); rs9923231 (G-1639A); rs9934438 (C1173T); rs8050894 (G1542C) and rs2359612 (C 2255T). Haplotype A carrying the minor alleles was associated with lower mRNA expression and lower warfarin maintenance dose, compared with the major allele haplotype B. The mean therapeutic doses of warfarin per day differed significantly based on SNPs (and its corresponding haplotype): 2.7-3.4 mg for haplotype A/A, 4.3-4.9 mg for genotype haplotype A/B, and 6.0-6.2 day for haplotype B/B.

Thus, the introduction of the determination of single nucleotide polymorphism of vitamin K epoxide reductase complex subunit 1 by polymerase chain reaction into the routine practice will optimize the selection of a dose of oral anticoagulants for patients who need it, and will significantly increase the effectiveness of treatment and reduce the risk of bleeding complications.

TREATING DISEASE WITHOUT MEDICINE

N. Gural - Machine building college of
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Nowadays unfortunately there are people with limited possibilities such as: problems with eyesight, deafness, lapse of memory, musculoskeletal system, and pathological nervous system damage (tremors, Parkinson's disease, etc.).

Solution is found by inventors who came up with chip plugged right in brain or well-placed implants on one's spine, man could gain manual control of his organs — man could slow down or speed up his heart beating, turbo-charge his liver, or tweak just about any other function of body. It is all about modulating one's nervous system, to improve or fix an underlying problems and it is called neuromodulation.

The brain-interface device was shown to work in six different animals, namely three pigs and three rhesus monkeys. "The wireless implant was electrically stable, effective in capturing and delivering broadband neural data, and safe for over one year of testing," noted the researchers in the study.

But there are still a lot of questions in this problem. The mechanical one: the brain sloshes around inside the skull every time one moves, and an implant that slips by a millimeter may become ineffective. The biological one: the implant must be nontoxic and biocompatible so as not to provoke an immune reaction. The mental one: how will those devises hold over a consciousness. And the last one how will the inventors and researchers from Finland, USA, Spain and other countries communicate?

The key to our tomorrow is a mutual language. That's why English have to get the position and the priority same to one's professional activity. These include a set of opportunities for oneself – realizing one's reserves, becoming asked-for. Such a person would bring the fame and the proud for his own country and obviously he could bring the future for the whole World. Solving problems the person would save someone's life just with his ideas, announced in a mutual language.

MORPHOLOGICAL CHANGES OF STOMACH INFLUENCED BY GENERAL DEHYDRATION

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S. Zolotova – E L Adviser

It is well known that the digestive system is very sensitive to a large number of different negative factors. In particular, frequent lesions in the stomach is exposed as its organ and the main reservoir of mechanical and chemical processing of food. It is necessary to say that the effect of dehydration of the stomach has not been adequately studied. The significant amount of water and electrolytes is deposited in the gastrointestinal tract and is involved in the exchange, circulating between blood and content of the digestive tract. That is why the aim of this thesis was to discover structural and morphological changes in stomach due to the total dehydration.

Firstly, to save water in the body the secretory activity is reduced by digestive glands. The mucous membrane of the stomach has a large number of glands that produce a secret for digestion. Under the influence of water deficiency changes in their morphological structure occur. Two groups of 10 mature animals were taken for the experiment. The first was a control group of intact rats, and the second group was subjected to total water deprivation. The results were evaluated on the 3-d, 6-th and 10-th day of the experiment. The fundal stomach department was taken as the test material.

Secondly, it was investigated that under the influence of the general water deprivation the atrophic changes of mucosa and submucosa of stomach are observed. Such disruptions of the structure becomes more pronounced with an increasing severity of the impact of dehydration factor.

Thirdly, under the severe water deprivation the thinning of the lamina propria of gastric mucosa and submucosa was observed. In some areas the focal disruption of the normal structure of the gastric glands was found. The diameter of the parietal and chief cells is reduced, in some parts of the glands the normal structure of cells is completely lost and nuclei are missing or are in various stages of apoptosis. Furthermore, unequal filling of submucosal blood vessels was found. Thus, the arteries are gaping and empty of blood, veins are being moderately filled with blood. These signs indicate that the factor of total dehydration leads to atrophic changes of the structural elements of the stomach wall.

Finally, these data suggest that changes which occur during the development of exsicosis after exhaustion of compensatory mechanisms become pathogenic and may be predictors of new pathological changes of the structural elements of the stomach.

THE MOST DANGEROUS DISEASE OF THE XXI CENTURY

A.S. Ivanova – Sumy State University, LS-511
Kurochkina – EL Advisor

Allergies are among the most common chronic conditions worldwide. Allergy symptoms range from making you miserable to putting you at risk for life-threatening reactions. According to statistics, today every fifth inhabitant of our planet suffers from allergy. In the developed countries, about 20% of people are affected by allergic rhinitis, about 6% of people have at least one food allergy and about 18% of people have asthma. International statistics shows that over the past two decades, the incidence of allergies has increased 3-4 times. And if the XX century was the century of cardiovascular diseases, according to the forecasts the XXI will be the century of allergy.

Allergy is known for a long time. Doctors of Ancient Egypt noticed symptoms that are similar to the symptoms of allergies. But mankind turned its attention to the allergy only in the XX century.

Allergies, also known as allergic diseases, are a number of conditions caused by hypersensitivity of the immune system to something in the environment. Allergy involves an exaggerated response of the immune system, often to common substances such as foods or pollen. The immune system is a complex system that normally protects the body against foreign invaders, i.e. bacteria and viruses. Allergens are substances that are foreign to the body and that cause an allergic reaction. Examples of allergens include pollen, dust mites, molds, animal proteins, foods, and medications. It's easy to come in contact with allergens, playing with your pet, or just walking out the door during allergy season.

Some allergies can take years to develop. It is important to diagnose the allergy before the crisis, so when you have the first symptoms you must go to the doctor immediately. Allergies can range from minor to severe. Anaphylaxis is a serious, potentially life-threatening allergic response that is marked by swelling, hives, lowered blood pressure, and dilated blood vessels.

So, always be attentive to your body, do not miss allergy symptoms that can lead to serious consequences.

INHIBITORS FOR CHOLESTEROL REDUCTION

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Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. Many of them involve atherosclerosis, which causes most heart attacks and strokes. Cardiovascular diseases are the leading cause of death globally. Nearly 2,200 Americans die of cardiovascular disease daily, with an average of one death occurring every 40 seconds. However, elevated levels of certain forms of cholesterol are some of the primary drivers in the development of some CVDs.

Cholesterol is an organic lipid molecule present in cells throughout the body, serves many important functions. It is an essential structural component of all animal cell membranes. Within cells, cholesterol is the precursor molecule in several biochemical pathways. Normally, the liver makes all the cholesterol the body needs. Eating habits and other lifestyle factors play a large role in determining the risk of heart disease and may prevent or even reverse this condition.

The bloodstream carries cholesterol throughout the body via special carriers called lipoproteins. The two major lipoproteins are low-density lipoprotein cholesterol—LDL-C—and high-density lipoprotein cholesterol—HDL-C. LDL tends to collect in the arteries, promoting atherosclerosis. Atherosclerosis starts when the endothelium becomes damaged, allowing LDL cholesterol to accumulate in the artery wall. The body sends macrophage white blood cells to clean up the cholesterol, but sometimes the cells get stuck there at the affected site. Over time this results in plaque being built up. This constricted circulation leads to less oxygen for the heart muscle, resulting in chest pain (angina), usually following exercise or excitement. It also stresses the heart muscle to the point of failure, which is what happens during a heart attack.

There are effective statin medications that can change blood cholesterol levels. Statins, first introduced in 1987, work directly to

block HMG Co-A reductase, a key enzyme the liver needs to manufacture cholesterol. Blockage of this enzyme results in depletion of cholesterol in the liver and an increase in the hepatic ability to remove cholesterol from the circulating blood. As a result, cholesterol levels drop and the lipid profile improves.

But there are some people who still don't get enough reduction in their LDL levels continue having cardiovascular events, even though taking full doses of the statins.

A rare genetic mutation called autosomal dominant hypercholesterolemia, which causes high LDL cholesterol levels, eventually led to a search for a new target for cholesterol lowering. Some people with an underactive copy of the PCSK9 gene, which regulates the body's LDL receptors, were found to have LDL levels of 15, instead of well over 100. They also had low levels of cardiovascular disease. And this led to the hunt for a drug that could mimic the effects of this.

There are now the PCSK9 inhibitors, a new class of cholesterol-lowering drugs that are self-injected once or twice a month. The medications work on the cholesterol receptor in the liver by a mechanism that is similar to statins, yet completely unique. The drugs not only reduce LDL cholesterol levels dramatically, but also take them to super low levels never seen before. There are now several PCSK9 drugs currently in various stages of development.

In sum, we would like to say that maintenance of cholesterol level is a main part of the homeostasis. A normal level of cholesterol in our organism is 5.0 mmol/l. An increased level of cholesterol can lead to the development of atherosclerosis. This disease is very common among adult people. The inculcation of new method among wide range of people with predisposition to atherosclerosis can help to prevent the development of this disease.

HYDRAULICS IN MEDICINE

M. Lytvynenko – Sumy State University, group EM-51
I.O. Zaitseva – EL Adviser

I am really interested in major laws and aspects of hydraulics. I would like to investigate the usage of hydraulics in medicine. After having learnt about the application of artificial lungs airing machine (aids ventilation) and diaphragm compressors, I have seen the importance of hydraulics in medicine. But I am just a beginner, so it's so difficult for me to concretize the exact sphere of my future research. I hope I will define it during the first two years of study at our university.

I would like to tell about a peristaltic pump, type of a pump used for pumping a variety of fluids. The advantage of using this mechanism is that it has contamination, because the only part of the pump in contact with the fluid being pumped is the interior of the tube, it is easy to sterilize and clean the inside surfaces of the pump. It needs the low maintenance, its lack of valves, seals and glands makes it comparatively inexpensive to maintain. It is able to handle slurries, viscous, shear-sensitive and aggressive fluids. Pump design prevents backflow and syphoning without valves. Typical applications:

- Medicine
- Dialysis machines
- Open-heartbypass pumpmachines
- Medicalinfusionpumps
- Testing and research
- AutoAnalyzer
- Analyticalchemistry experiments
- Carbonmonoxide monitors
- Mediadispensers
- Chemicalhandling

- Printing, paintandpigments
- Pharmaceutical production
- Dosing systems for dishwasher and laundry chemicals
- WaterandWaste
- Chemical treatment in water purification plant
- Sewage sludge
- Aquariums, particularly calciumreactors

Another a very important thing in medicine is a hydrauskalpel - liquid jet scalpel, which does not damage the vascular system for operations on internal organs. High pressure at the unit removes muscle tissue with minimal blood loss. Such a device has two scalpels - the larger and smaller diameter for different kinds of fabrics. The device has the weight about 70 kilograms and works without a power supply and can be easily transported. Externally, the device is similar to the drill, from which flows under high pressure thin stream of water from a syringe. This knife can be used many times in the treatment of abscesses in surgery. It does not destroy the organ. In addition, hydrauskalpel is successfully used by gynecologists, urologists, surgeons. Thanks to a new method the manipulation takes half of the time. Under the influence of a high pressure it is separated tissue with little or no damage to the vascular system, that is with minimal blood loss. This allows not only to reduce the duration and invasiveness of surgical interventions, but also significantly reduce the period of postoperative rehabilitation of patients.

ASSOCIATION OF K121Q POLYMORPHISM ENPP1 GENE WITH T2DM IN PERSONS OF DIFFERENT SEXES IN UKRAINIAN POPULATION

I. V. Marchenko, Sumy State University
S. G. Zolotova – E L Adviser

Nowadays, the biological role of Ectonucleotide Pyrophosphatase Phosphodiesterase 1 (ENPP1) is not fully understood, but there are two groups of evidences concerning the ENPP1 significance in pathogenesis of some pathological processes and diseases. One of them is about the ability of ENPP1 to influence insulin sensitivity by downregulating insulin receptor signaling. This is considered to be in association with insulin resistance and type 2 diabetes mellitus (T2DM).

Venous blood from 163 patients with T2DM and 110 healthy individuals (control group) was used for genotyping. The definition of K121Q polymorphism (rs1044498) of ENPP1 gene has been examined by PCR-RFLP. The association between the K121Q polymorphism of ENPP1 gene and the development of T2DM has been revealed with the use of $\chi 2$-Pearson criterion. It was shown that in patients with T2DM the value of homozygotes for major allele (K/K) and minor allele (K/Q+Q/Q) is 65.0 and 35.0% respectively, while in the control group –75.5 and 24.5% respectively (P=0.067). The value of the given options, polymorphism in females is unreliable in patients with T2DM KK genotype – 59.8% and KQ+QQ genotypes – 40.2%, in the control group genotype KK – 78,1% and genotypes KQ+QQ – 21.9% respectively (P=0.063). The distribution of allelic potions K121Q polymorphism in males also didn't differ in comparison with patients with T2DM genotype KK – 71.1% and genotypes KQ+QQ – 28.9% those of the control group genotype KK – 74.4% and genotypes KQ+QQ – 25.6% respectively (P=0.645).

There is no link between the polymorphism K121Q of gene ENPP1 and the T2DM in males and females in Ukrainian population.

FEATURES OF DIAGNOSIS AND TREATMENT OF ENCYSTED PLEURAL EMPYEMA

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S. Zolotova – E L Adviser

The incidence of non-specific pathological processes of the lung and pleura increases every year. Encysted empyema is leading in terms of morbidity and mortality among all the diseases of the lungs and pleura. Just empyema remains one of the biggest problems in diagnosis for doctors of primary and secondary levels of medical care. Up to this point there is no single diagnostic algorithm for the disease. And as a result we don't have the single algorithm of treatment of encysted pleural empyema.

Encysted pleural empyema can be diagnosis by ultrasound, CT, and X-rays. But we don't have CT and ultrasound in every hospital and patients with this pathology must be treated in special hospitals. This fact makes patient's recovery time longer.

One of the oldest methods of diagnosis is the X-Ray investigation. But in spite of the fact that this method is ancient, it is one of the main one in the diagnosis of this pathology. The combination of physical and multipurpose X-ray investigations is the most affordable that enables us to detect this pathology and prevent long-term treatment of non-specialist hospitals and to prevent various complications.

The treatment of encysted empyema is a long and complicated process. The best known way to treat this disease is aspiration. In many cases, rehabilitation of encysted pleural empyema aspiration with abscess flushing by non-specific antiseptics can lead to empyema elimination. In other cases, such sanitation will be a reliable preoperative preparation.

Operative treatment of empyema includes very traumatic surgery with high mortality. That is why surgeons are trying to create the single general algorithm of diagnosis and treatment of encysted empyema. This kind of algorithm will reduce patient recovery time and the degree of disability and mortality.

FUTURE OF MEDICINE

Y.Mischenko – Sumy State University, group IT – 51
A.M.Diadechko, E L Adviser

Medicine is the science and practice of the diagnosis, treatment and prevention of disease. For the last years medicine has evolved greatly. And many new achievements have appeared.

Health Watch, house call is back. Doctors can already gather your glucose from their gardens and check your liver from the links. Remote medical monitoring will be commonplace in the future and it promises to benefit both physicians and patients by saving time and money.

Imagine a world where there is no donor organ shortage. Where victims of spinal cord injuries can walk, where weakened hearts are replaced. This is the long-term promise of regenerative medicine, a rapidly developing field with the potential to transform the treatment of human disease through the development of innovative new therapies that offer a faster, more complete recovery with significantly fewer side effects or risk of complications.

Pandemic research, Influenza viruses are classified as type A, B, or C based upon their protein composition. Type A viruses are found in many kinds of animals, including ducks, chickens, pigs, whales, and also in humans.The type B virus widely circulates in humans. Type C has been found in humans, pigs, and dogs and causes mild respiratory infections, but does not spark epidemics. Type A influenza is the most frightening of the three. It is believed responsible for the global outbreaks of 1918, 1957 and 1968.

Nanomedicine is promising great things, including great advancements in the treatment of cancer. Imagine swarms of nanobots swimming through your veins, repairing cells or attacking viruses. On second thought, get that image out of your mind, it's a bit creepy. Just close your eyes and wait for the healing to begin.

Organ printing printable organ is an artificially constructed device designed for organ replacement, produced using 3D printing techniques. The primary purpose of printable organs is in transplantation. Research is currently being conducted on artificial heart, kidney, and liverstructures, as well as other major organs. For more complicated organs, such as the heart, smaller constructs such as heart valves have also been the subject of research. Some printed organs have already reached clinical implementation, and primarily

include hollow structures such as the bladder, as well as vascular structures such as urine tubes.

NEW JOINT INITIATIVE TO EXPLORE CLINICAL INTERPRETATION OF MOLECULAR TESTS FOR CANCER

E. M. Nikolaenko – Sumy State University, group LS – 420
V. E. Pronyaeva

New life requirements enforce doctors navigate one of the most important scientific questions faced by the cancer community could help improve survival rates for patients. A joint initiative of UNICANCER, ESMO and Cancer Research UK, the meeting on Molecular Analysis for Personalised therapy (MAP) will explore clinical interpretation of molecular tests for cancers that have spread.

By learning more about their patients' genetic makeup, doctors hope to develop more effective and customised strategies for prevention, screening and therapy. In addition, these techniques strive to lower treatment side effects.

The development of new biotechnologies has revolutionised the applications of personalised therapy in advanced cancer that has spread.

It is now possible to perform multigene sequencing for cancer patients, either in clinical trials or in routine use, and the knowledge gained will help clinicians prescribe therapies specifically adapted for each individual patient's case, which could reduce overall treatment costs and ultimately provide better care.

Co-founder Pr Fabrice André of the Gustave Roussy Institute in Villejuif, explained why the programme of this new meeting was so vital, helping medical oncologists translate latest clinical research into applicable medical treatment approaches.

The results of genomic research have already yielded results for new cancer therapies. Because each person’s sequencing may show a myriad of mutations, may of which may be rare or unique, precision cancer medicine is a highly complex process, explained Cofounder Pr Charles Swanton, Cancer research UK scientist based at the Francis Crick Institute.

IMPLANTOLOGY

T.A. Palij – Sumy State University, group SM – 404
O.I. Nefedchenko – E L Adviser

People tried to replace their lost tooth by a new one from ancient times. They used different materials to make an artificial tooth: wood, bone, stone. Besides, teeth of dead animals were used. These so-called implants were uncomfortable and temporary.

In 19 century intraosseous implantology began to develop. Sweden is considered the motherland of modern implantology. Dental implantology is a new branch of dentistry, which involves the reconstruction of missing teeth and their supporting structures with natural or synthetic substitutes. In 1978, Professor Per-Ingvar Branemark defined necessary conditions for successful dental prosthesis using implants.

Dental implant - artificially made, often multi-component structure used for the introduction into the bone tissue of the jaw, followed by coalescence (osseointegration) to prosthetics. Implants replace a lost tooth roots, allowing carrying out the restoration of the dentition later.

There are 2 types of implants: collapsible implant, molded implant.

We want to underline the indications to the modern implant:

a) With the loss of one or more teeth bone becomes thinner over time, which leads to deformation of the maxillofacial system.

b) The implant is the same as the root of a natural tooth, is a reliable support for the bone.

c) Everyone who has lost one or more teeth due to various injuries, disease or tooth decay, automatically becomes a candidate for dental implants.

Using implants has many positive sides: good cosmetic effect; restoration of important physiological functions; prevention of negative consequences of the lack of teeth. Installation of the implant allows you to: restore the lost tooth without damaging the healthy adjacent teeth; create additional support and to establish non-removable prosthesis; to create a support for better fixation of removable prosthesis.

AUTOIMMUNE DISEASES. HOW TO PREVENT THEM?

D. Pliushchyk– Sumy State University, group LS-511
V.S. Kurochkina – EL Advisor

An autoimmune disease is a disease in which the immune system mistakenly attacks the body's own cells and tissues.

Different body parts like digestive system, joints, nerves, blood vessels, red blood cells, connective tissues, skin and endocrine system can be affected. It's found that autoimmune diseases and conditions predominantly affect people during the childhood. Autoimmune disease and condition symptoms vary from individual to individual.

It's estimated that 8 percent of people in the world are living with an autoimmune disease. It turns out that nearly 14 million people (5%) in the USA and more than 2 million people (5%) in Ukraine suffer from autoimmune diseases. And spreading of autoimmune diseases is constantly increasing. It is also established that 75 % of those living with autoimmune diseases are female.

Unfortunately, living in pain many people don't even realize they have an autoimmune disease.

There are more than 80 different types of autoimmune diseases, but some of the most common ones are: polymyalgia rheumatica, rheumatoid arthritis, lupus, Sjogren's syndrome, scleroderma, goodpasture's syndrome, guillain-Barre syndrome and wegener's granulomatosis.

The common causes of autoimmune diseases are a hereditary or genetic cause, hormonal status, exposure of toxic metals and chemicals, bacterial and viral infections, vaccinations, stress, nutritional deficiencies and smoking.

Modern medicine considers all autoimmune diseases to be incurable, but researchers are looking for new ways to treat them. Medications can help slow the progress of the disease. Additionally, lifestyle changes may be incorporated into an autoimmune disease treatment plan.

Physicians give the following simple advice for controlling autoimmune diseases: a healthful diet, getting rid of food allergens, the elimination of toxins from the body, stress management, acupuncture, taking physical rest and avoiding expose to the sun.

INNOVATION TECHNOLOGIES IN MEDICINE: PRESENT SITUATION AND PERSPECTIVES

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Nowadays information technologies (IT) are introduced almost in all spheres of health care system. Due to them, medicine has acquired absolutely new features. A lot of researches are impossible without computers and special software. This process is accompanied by considerable changes in medical theory and practice, which cause changes in preparing of medical staff. IT help a doctor to carry out objective diagnostics, to accumulate and effectively use obtained information on all stages of treatment, and what is the most important for medical science, they are invaluable in scientific cognition.

The aim of the research was to show the connection between IT development and practical medicine, medical science.

Innovation technologies in treatment. In 2015 «Philips» company presented EchoNavigator system on the Congress of European Society of Cardiology. The system uses a revolutionary technology of intervention visualization due to combining rontgenography and echocardiography, which allows combining medical instrument reading with image in real-time mode. The cardiac surgeons obtained more interactive and intuitively understandable method of minimally invasive procedures conducting while treating structural heart diseases. Such revolutionary decision allows treatment of ischemic heart disease using minimal invasive intervention. «Philips» also presented the first angiographic system Allura Clarity with unique technology Clarity IQ. Allura Clarity IQ suggests the highest quality of image in coronarography in the case when radiation dose is reduced by several times. Traditionally, the reduction of radiation dose during intervention rontgenographic procedure worsened the quality of an image and as a result it complicated diagnosing and treatment of a patient.

Such technologies can not only sufficiently increase the effectiveness of diagnosing, but also decrease the risk of

complications because of radiation exposure of patients and medical staff. Thus, IT will soon change cardiac care on all stages of patients' care.

Scientific research in medicine. There appeared a number of new branches in a new millennium, which enable the usage of new IT: nanotechnologies - probe microscopy, tunneling spectroscopy, molecular diagnostic of cells, microorganisms, genetic pathology; visualization and identification of protein molecules, internal cellular processes at chemical and wave impacts; molecular "assembling" of biosensors, biocompatible polymers and tissues, electron-beam and laser effect on cellular structures and molecules of biological tissues. Biomedical research in combination with mathematical and computer modelling of structure, functions, behavior, genesis and pathology of a living organism, its systems, organs, tissues, cells, energy and mass exchange, physical fields, sensed signals, structure and usage of simulation models of organism and systems functioning for computer control of life-supporting equipment and therapy, including biofeedback. Multiple-factor energy deposition for diagnostic and therapeutic purposes on systems, organs, tissues of an organism, including at the cellular and genetic level with the help of electromagnetic, laser, ionizing, thermal, ultrasonic, modulated (in time and space) radiation while monitoring the condition of an organism. Microanalysis of biological fluids and tissues with the help of radionuclide, immunoenzyme, luminescent, interference analytical methods with automation selection and sample preparations and computer processing of obtained information. Creation of bioartificial organs and tissues, including hybrid organs, and providing their biological compatibility, their instrumental, therapeutic, pharmacological support in clinics and at patient's home.

Thus, computer technologies are highly perspective for medical science and can make invaluable contribution to the treatment in future.

INNOVATIONS IN MEDICINE AND MODERN LIFE

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L.A. Denisova – E L Adviser

Medicine is today perhaps the most dynamically developing branch of science. This is due to its huge social importance.

High rate of new discoveries in this area is associated with a large number of enthusiasts who are working to make people's lives easier, better and longer. Among other things, there is no medicine in any one of the priority areas, and science itself is very, very extensive.

At present scientists are almost ready to solve the problem of donor organs. Long ago it was announced that this problem would disappear itself after the equipment for growing organs in the laboratory will was created. And here it is. Recently some investigations have been conducted in China. As a result mouse liver bud was created. Later it was implanted in to the other mouse successfully. A few days past and all the vessels grown together properly, and the liver began to function adequately.

Eyesight is one of the five basic senses and it provides 90% of information for human brain. As a result, the eyes and their functioning will always play a huge role. It is not surprising that many of the achievements in medical science are aimed at maintaining good sight or correcting the bad one. An interesting invention, which has been released recently is the so-called individual telescopic lenses.

The next burning problem is the fight with cancer. Today, this dangerous disease is usually cared with the help of surgery, chemotherapy, or ruinous rays, which destroy tumors. All this treatments are ruinous not only for the tumor, but also for healthy cells. That`s why many innovations are aimed at finding effective, fast and not harmful remedy to overcome tumor processes. One of the latest discoveries is the creation of experimental equipment, the main active part of which is a kind of needle. It is inserted in to the tumor and produces special micropulses, forcing pathologically changed cells to start the process of self-destruction.

The achievements in medical science are truly enormous. Thanks to modern technological advances, such diagnostic methods exist: endoscopy, ultrasound, computer and magnetic resonance tomography. Without the development of biochemistry it would be impossible to have serious innovation in the field of pharmacology.

Innovations in medicine have helped to increase life expectancy of many patients significantly. Over the past century, this indicator has increased by about 20 years. And now he is constantly growing.

The scientists have always dreamed of creating an equipment, which will help to determine the presence and character of microorganisms that hit the human body. At present, the research takes not only days, but weeks. Swiss scientists have been able to invent and create a prototype of an apparatus capable of identifying the microorganisms in a given environment, and determining the particular species. In future this will allow to subscribe the correct treatment in curing any infectious disease. This will reduce the duration and severity of serious diseases, and also to avoid many complications.

New things in medicine appear almost every week. Now scientists have come close to serious discoveries that will enable people with disabilities to regain an adequate level of social activity. Today there are techniques that can restore the integrity of the previously destroyed nerve. This will help patients with paralysis and paresis recover their motor abilities. These treatments are still very costly, but in 5-10 years so far they will be available for people with quite ordinary income.

Perhaps in the near future there will be no diseases that will not be able to cope with modern medicine.

PROTECTIVE ROLE OF THE PLACENTA AGAINST TOXIC EFFECTS OF CADMIUM

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The placenta has a number of features that ensure the passage of many biological substances to the fetus, as well as the function of barrier for certain substances. According to researchers, it can be used as a marker of unfavorable environmental action.

One of the most toxic trace elements is cadmium. This trace mineral is also determined in the organism of newborn children. With age, cadmium accumulates in the body, and in 50 years its content can reach up to 20-30 mg. In nature cadmium is present in soil, food, sea water. Mining and metallurgy, electronic and electrical industry, superphosphate fertilizers are an important source of cadmium contamination. The content of cadmium in the environment most regions of Ukraine has increased after the Chernobyl disaster.

Placenta, kidney, bone marrow, semen, liver, bone and spleen are target organs of cadmium toxicity.

The penetration of cadmium through the placenta is negligible, therefore, its content in the mother's blood 2 times higher than in the blood of a newborn baby. High level of cadmium accumulation in the placenta indicates protective properties of the latter relative to the cadmium. Elevated concentrations of cadmium were detected in the placenta of mothers who gave birth to children with low birth weight. According to the researchers, the intrauterine

growth retardation caused a violation by cadmium transplacental transfer of zinc to fetus.

The effect of cadmium occurs due to the use of contaminated food (in particular seafood - especially mussels and oysters), cereals and leafy vegetables, polluted air (industrial pollutant), smoking (active and passive) by a pregnant woman. This makes a subsequent negative impact on the fetus.

The content of cadmium in the blood is 0,4 -1,0 μg / l. Its concentration in plasma of cord blood is 0,3-0,5 μg / l, in erythrocytes - 0.5-0.9 μg / l.

The concentration of cadmium in the placenta of pregnant women is higher than in cord blood and maternal blood, and the concentration of this metal is lower in maternal blood compared to cord blood.

Based on the foregoing, modern, actual problem is the study of the toxic effects of cadmium in the system of mother-placenta-fetus. It is important to study the role of cadmium as a toxic factors contributing to miscarriage, prematurity and intrauterine growth of retardation.

INNOVATIONS IN MEDICINE

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The problem of improving healthcare services through implementing new technologies is vital these days. Innovations in medicine enrich medical practice; they also make a valuable contribution into successful treatment and even saving human lives. In this light, a few mainstreams within the general tendency of introducing medical inventions and improvements should be mentioned.

Using specially designed scanners for diagnosing different skin diseases without an invasive surgical biopsy is quite a promising technique nowadays. For example, new optical scanners collect information at several electromagnetic wavelengths, process data using algorithms and match against a registry of a number of digital images of melanoma and various skin diseases. This procedure lets the patients avoid surgery scars and reduces the costs spent.

People who suffer from diabetes face the problem of monitoring and correcting glucose levels daily. 'Bionic Pancreas' for type 1 diabetes can be a perfect solution in this case. The system includes a continuous glucose monitor and a "brain" (such as a smartphone) that calculates what the patient needs to maintain appropriate glucose levels, and then communicates with an infusion device that delivers insulin or glucagon. Devices of that sort can greatly simplify daily routine of the diabetics.

Another purpose of modern healthcare system is introducing new methods for pain relieving. Of course, ‘electronic aspirin’ has nothing to do with chemical tablets and pills. A technology is a patient-powered tool for blocking SPG signals at the first sign of a headache. The system involves the permanent implant of a small nerve stimulating device a handheld remote controller. According to tests electronic pain relieving has proved efficiency and simplicity.

New ways of treating data obtained by means of traditional devices is another trend in modern medical researches. Some new studies report that electroencephalography (EEG) may be helpful in determining psychosis risk, deciding on psychosis therapy, and

possibly even in treating schizophrenia through an EEG-based biofeedback-like process. A new approach to processing EEG results is very valuable for predicting symptom severity, which determines course of treatment.

Getting information about the patient's state constantly, regularly and efficiently is an urgent issue for modern doctors. An important step in this direction is using tiny ingestible sensors placed in pills. Sensors of this sort can record the way the medication is ingested, as well as the patient's heart rate, body temperature and position, and rest and activity patterns. The data are wirelessly transmitted to a smartphone app, which then sends it to a provider, caregiver, or family member.

Modern healthcare services are introducing new forms of doctor-patient interaction. After telemedicine having become a common practice, new medical robots go one step further – they can now patrol hospital hallways on more routine rounds, checking on patients in different rooms and managing their individual charts and vital signs without direct human intervention.

As far as the number of gadgets for measuring and monitoring data is growing constantly, the problem of processing and interpreting patient-generated date has emerged. A lot of wearable devices like smart watches and fitness trackers are able to track blood pressure, cardiac output and stroke volume as well as blood oxygen concentration. Some scientists believe that large volumes of information should be overseen, processed and displayed by specially created medical software. Very soon you won't need a doctor to get a complete physical.

Modern smartphones are powerful enough for providing their users with storing large amounts of information and calculating data. Many medical scientists are about to take advantage of utilizing mobile devices. Having connected smartphones to some optical peripherals, doctors get the opportunity for capturing, storing and evaluating images of different segments of the eye. It decreases the use of expensive equipment and makes relevant information portable and easy to reach. Summing up, new technologies are used to turn modern medicine into a powerful tool for diagnosing and treating.

THE INCREASE OF MUSCULAR ACTIVITY OF MIDDLE-AGED PEOPLE PLAYING BADMINTON

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Today, there is no need in the presentation of numerous facts and data about the great importance of muscular activity in order to enhance human physical performance. In recent years, the reduction of life expectancy and the vigorous activity of the middle-aged and elderly people tends to be constant. The presence of this trend defines a large number of social and economic factors and in this connection rational search of new ways to change this situation becomes very important.

Scientific achievements conclusively prove that one of the most effective ways to solve this problem is regular exercise. A number of studies [1; 2] prove that the rational use of physical exercise not only slows down the aging process, but also results in increased efficiency, a substantial improvement of physical condition. A lot of studies [3] confirm the positive impact of physical activity on the regression of functions of the human body, and it is differentiated depending on the type of sports specialization.

As a variant of physical activity for middle-aged people and especially for staff and teachers of higher educational establishments the authors of this study propose badminton as one of the best ways in increasing of muscular exercise. Badminton is a very affordable sport as it does not imply any restrictions on the initial opportunity to do. However, sport is very effective means of diversifying of physical development. Badminton refers to acyclic high-coordination kinds of sports. It has the following points: the speed of movement and performance techniques with a maximum reduction of preparatory actions, quick thinking and the ability to make quick decisions in various game situations. Playing badminton requires special physical and psychological qualities: physical endurance, agility and coordination, operational and analytical thinking,

creativity, persistence of attention, speed of reaction and high level of health.

Under the influence of training loads when playing badminton the musculoskeletal system of sportsmen strengthens, a variety of motor qualities as well as accuracy and coordination develops, and as a result, all basic vital functions are activated. This workout is accompanied by a positive emotional background, psychophysiological unloading that is reflected in the motivational value with regard to the training process. Thus, we can conclude that badminton sessions generally increase the level of functional condition, muscular activity and endurance of middle-aged sportsmen. This category of people is able to maintain the high level of efficiency in the process of life. Taking into account age characteristics and health status of sportsmen it is necessary to control their functional and physical condition in the training process.

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TOP 5 INVENTIONS IN MEDICAL TECHNOLOGY

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By defintion, medicine is the science of diagnosing, treating, or preventing disease and damage to the body or mind. A medical invention would be any instrument, machine, implant, or similar article that is useful in the diagnosis, treatment, or prevention of disease, for example: the thermometer, artificial heart, or a home pregnancy test.

So here I would like to present you top 5 inventions in medical technology.

AbioCor Artificial Heart

Although artificial hearts have been used in humans before, AvioCor proved to be more technically advanced than all of its predecessors. It is worth mentioning that previous artificial hearts required the user to be connected to a huge console through tubes and electrical power lines that passed through the person's skin. This meant that the patient had to be bedridden.

Robots Helping Perform Surgeries

It is too early to talk about autonomous machines that will be able to perform serious surgeries. Nevertheless today we have robo-surgeons that with the help of humans carry out serious operations.

In 2010 a group of surgeons at McGill University used the da Vinci robo-surgeon together with a robot anesthesiologist, dubbed ironically McSleepy, to remove a patient's prostate. It was the world's first surgery performed without direct implication of humans, with surgeons involved only in the process of controlling the robots/

iLIMB Bionic Hand

Invented by David Gow in 2007, the device, known as the iLIMB, became the world's first artificial hand to boast 5 individually powered fingers.

To develop the iLIMB, Gow had to overcome a large number of obstacles. He built the iLIMB with 3 separate parts: the finger, thumb and palm, with each part featuring its own motor-control system.

It would be interesting to note that the iLIMB was named by the "Popular Science" magazine one of the best innovations.

Camera Pill

The device was developed with the goal of taking quality, color images in confined spaces.

It can detect early signs of esophageal cancer, which is the fastest growing type of cancer in the United States.

Using the new scanning device is rather cheap due to the fact that it is small and there is no need of anesthesia and sedation.

Bio-Artificial Liver

The device is called "bio-artificial" due to the fact that it is made of both biological and manufactured component parts. The blood of the user circulates through the device and a unique synthetic membrane parts it from the animal cells. It would be interesting to note that the membrane plays an important role in the device - it prevents the rejection of the cells, while permitting the cells to detoxify the user's blood just like a natural liver.

INNOVATIONS IN MEDICINE AND MODERN LIFE

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Nowadays medicine is not static and introduces innovations to improve our modern life. There are new diseases in addition to the old and even the best doctors are not able to understand and establish the correct diagnosis. IT technologies help doctors to diagnose any disease in detail, store and effectively use data at all stages of the treatment process. Innovations save thousands of lives every day and raise medicine every time on one level higher.

Special attention must be given to the main lines of modern technologies in medicine. Medical information system provides the process of collection storage, processing of information. Medical diagnostics conducts sophisticated modern studies such as computed tomography, studies using isotopes. Man is not able to accept and processes lots of information received in these studies. Expert systems help in solving problems of diagnosis, prognosis of diseases and complications and planning treatment processes.

People create a large number of robots that perform extremely complex manipulations. Surgical robot “Da Vinci” allows through small holes in the skin to perform the most difficult operations on internal organs. One of the best medical sensations is “Robotic Glove”. This glove is equipped with sensors, which signals the organs that are needed the immediate attention. It collects and transmits all data on the computer. Medical robot “AMIGO” specializes in operations for the heart artery treatment. It helps to introduce a catheter through an artery to the heart damage areas.

There are many scientific researches in medicine: nanotechnology, biomedical research combined with mathematical and computer modeling, multifactor energy impacts in diagnostic and therapeutic purposes in organs, systems, tissues etc. It is able to produce viable cartilage implants to those patients who need them.

Medicine is considered to be one of the most important necessity to all of us. "The 21st century art of healing" is impossible without modern IT technologies and innovations.

LOGISTIK IN DER MEDIZIN

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In diesem Artikel geht es um die Anwendung der logistischen Verfahren in der Medizin. Heute spielt die Logistik eine große Rolle in vielen Bereichen, weil ihr Hauptziel ist, alle Prozesse so zu optimieren, dass die Kosten reduziert werden könnten. Außerdem sind Preis, Qualität und Schnelligkeit die wichtigsten Kriterien, auf die sich Logistik orientiert. In der Medizin sind diese drei Kennzahlen sehr oft für Patienten lebenswichtig. Für die Anschaulichkeit, welche Verbesserungen Logistik für die Medizin hineinlegen kann, gibt es zwei Beispiele.

In Kasachstan werden zu wenig Medikamente produziert – aus anderen Ländern importierte Medikamente betragen zurzeit ca. 80%. Dabei ist die Lieferkette vom Ausland so gebildet, dass es mehr Kettenglieder gibt als es sein könnte. Zwischen allen Gliedern gibt es unbedingt ein Lager. Diese zwei Faktoren fließen direkt auf den Endpreis für die Kunden ein. Je mehr gibt es Akteure und Zwischenlager bei ihnen, desto mehr wird der Kunde auf Arzneimittel warten und für sie zahlen, deswegen spricht man über die Optimierung der Kette, die zur höheren Qualität, niedrigeren Transportzeit und zu niedrigeren Preisen führt.

Eine andere Richtung für die Logistik in der Medizin ist die Rettungsdienstarbeit, insbesondere der Dispatcherdienst. Es gibt nicht genug hoch qualifizierte und erfahrene Ärzte, deswegen arbeiten fast immer in den Rettungszentralen als Dispatcher Studenten oder Absolventen, für die es keine strikten Voraussetzungen gibt, außer Hochschulausbildung. Das Problem ist, dass genau diese Studenten und Absolventen Entscheidung treffen sollen, ob es ein Notruf ist oder nicht, ob eigentlich eine Brigade sofort oder nicht reagieren muss. Dafür brauchen Dispatcher ein System, das helfen wird, Dringlichkeit des Rufes zu bestimmen, besonders bei Scheinrufen.

Die Anwendung von logistischen Verfahren führt zur Steigerung der Effektivität in Gesundheitswesenssystem.

INNOVATIVE TECHNOLOGIES FOR MAKING VESSELS CLEAN FROM ATHEROSCLEROTIC PLAQUES

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Very often the reasons of the illnesses connected with a cardiovascular system (mainly atherosclerosis) are: unhealthy lifestyle and a lot of environmental factors. The statistics say that atherosclerosis is one of the most common deadly diseases in the World, the death rate is nearly 800 - 100 000 (it means every 125 human).

The aim of this work is to study the etiology and pathogenesis of atherosclerosis, treatment of this disease with the help of modern technology, and clarify if modern Ukrainian medicine can establish and realize these technologies.

Atherosclerosis is a disease characterized by the deposition of cholesterol on the walls of vessels. In the end it can lead to such complications as a stroke or heart attack. Nowadays scientists from Israel invented the ateroektomical "machines" with different types of blades that clean vessels from atherosclerotic plaques not injuring the walls of vessels. The benefits of these technologies are conducting shunt directly to the place of destruction. Rotating motions of the blade cut atherosclerotic plaques, and their remains are sucked by a vacuum apparatus. In that way these technologies provide a complete cleaning of vessels from remains.

Due to the fact that this disease has spread among young people, implementing of these technologies can be an important step to help reduce the statistics of atherosclerosis.

GLUTAMATE IMAGING MAY GUIDE SURGERY IN 'NONLESIONAL' EPILEPSY

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V. E. Pronyaeva

Glutamate imaging may be capable of identifying the focus of epileptic seizures in patients who appear to have nonlesional epilepsy on standard imaging techniques, researchers report in Science Translational Medicine.

The findings are based on just four patients, but the team chose to publish the results to speed wider validation of the technique, saying that it could lead to substantial improvements in the treatment of patients with drug-resistant epilepsy.

Because it is well established that patients with lesional epilepsy have better surgical outcomes than those with nonlesional epilepsy, new neuroimaging techniques capable of detecting subtle lesions could potentially improve patient care and increase the chance of seizure freedom after surgery.

The four patients, who all had temporal lobe epilepsy (TLE), had been classified as having nonlesional epilepsy based on standard, which the team says is the case for about a third of TLE patients.

Is one patient, magnetic resonance spectroscopy (MRS) findings also shoed increased glutamate levels in the ipsilateral hippocampus. The other three patients did not have usable MRS results, because of motion and susceptibility artefacts.

One patient underwent right temporal lobectomy, and pathological analysis showed hippocampal changes consistent with mesial temporal sclerosis.

Glutamate helps finding the epileptic foci in a specific brain region, gives clinicians critical information to guide targeted therapies that have the potential to control seizures in patients that currently do not have treatment options.

SECTION 4 CHANGES IN ECONOMY

EMERGING COUNTRIES AS A FUTURE MARKET LEADER

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A modern world is changing very fast and the leadership of United States of America and Europe is becoming weaker than a few years ago. Nowadays some emerging countries are now trying to become the future economics' leaders. Such countries as Brazil, China and India have fast growing economies which will soon be even more effective than the western economies. They are taking more space in the international trade. This new dimension of the economy opens a lot of new opportunities to companies and organizations which are not afraid of investing abroad.

First of all we have to say about the importance of defining what an emerging country is. According to the Rostov's Model of Development (1960), countries go throw five steps between the traditional society and the high mass consumption that we know in western countries [1]. The main parts of emerging countries are situated between the third and fourth step. This is period when the countries take-off and drive to maturity. We can characterize the state of these countries as "a short period of intensive growth, in which industrialization begins to occur". After this happens a longer stage where "standards of living rise, use of technology increases, and the national economy grows and diversifies". Those steps describe the actual state of the main of the emerging countries and their economic growth. Emerging market (or a rapid growing market – RGM) is a progression in a nation's economy towards becoming an advanced and liberal country or region that is shown by some liquidity in local debt and equity markets and the existence of some form of market exchange and regulatory body. Generally, emerging countries are described by a growing population experiencing a substantial increase in living standards and income, rapid economic

growth, and a relatively stable currency. Although, emerging markets have a physical financial infrastructure like banks, a stock exchange and a unified currency [2]. Though, emerging markets continue to give investors' attention over the world by taking a chance with greater risk to get higher revenue, as they often experience faster economic growth as measured by GDP. Urbanization and technological development are the key "engine" of rapidly growing economies. Urbanization brings an environmental pressures and growing demand and importance for health-care system and education services. The next opportunities for business depend on the fast growth in urban populations across the RGMs. These include:

- rising demand for consumer goods and services;
- potential for companies to shift production to locations where employment, infrastructure and the investment climate is improving fast, but wages remain competitive.

But at the same time it requires social development, increases demand for public securities, etc. Also emerging markets can still bring a lot of challenges because of volatile economy, sometimes unstable currencies, less infrastructure and more conservative regulatory bodies.

1. Binns, Tony, (2008). "Geographies of Development: An Introduction to Development Studies", 3rd ed. Harlow: Pearson Education).

2. "Emerging Market Economy", Investopedia, http://www.investopedia.com/terms/e/emergingmarketeconomy.asp

MONOPOLIES AND OLIGOPOLIES

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A monopoly exists when a specific person or enterprise is the only supplier of a particular commodity. Monopolies are thus characterized by a lack of economic competition to produce the good or service, a lack of viable substitute goods, and the possibility of a high monopoly price well above the firm's marginal cost that leads to a high monopoly profit. The verb “monopolise” or “monopolize” refers to the process by which a company gains the ability to raise prices or exclude competitors. In economics, a monopoly is a single seller. In law, a monopoly is a business entity that has significant market power, that is, the power to charge overly high prices. Although monopolies may be big businesses, size is not a characteristic of a monopoly. A small business may still have the power to raise prices in a small industry (or market).

A monopoly is distinguished from a monopsony, in which there is only one buyer of a product or service; a monopoly may also have monopsony control of a market sector. Likewise, a monopoly should be distinguished from a cartel (a form of oligopoly), in which several providers act together to coordinate services, prices or sale of goods. Monopolies, monopsonies and oligopolies are all situations such that one or a few of the entities have market power and therefore interact with their customers (monopoly), suppliers (monopsony) and the other companies (oligopoly) in ways that leave market interactions distorted.

Monopolies can be established by a government, form naturally, or form by integration.

In many jurisdictions, competition laws restrict monopolies. Holding a dominant position or a monopoly of a market is often not illegal in itself, however certain categories of behavior can be considered abusive and therefore incur legal sanctions when business is dominant. A government-granted monopoly or legal monopoly, by contrast, is sanctioned by the state, often to provide an incentive to invest in a risky venture or enrich a domestic interest group. Patents,

copyrights, and trademarks are sometimes used as examples of government-granted monopolies. The government may also reserve the venture for itself, thus forming a government monopoly.

Oligopoly is a common market form where a number of firms are in competition. As a quantitative description of oligopoly, the four-firm concentration ratio is often utilized. This measure expresses the market share of the four largest firms in an industry as a percentage. For example, as of fourth quarter 2008, Verizon, AT&T, Sprint, and T-Mobile together control 97% of the US cellular phone market.

Oligopolistic competition can give rise to a wide range of different outcomes. In some situations, the firms may employ restrictive trade practices (collusion, market sharing etc.) to raise prices and restrict production in much the same way as a monopoly. Where there is a formal agreement for such collusion, this is known as a cartel. A primary example of such a cartel is OPEC which has a profound influence on the international price of oil.

Firms often collude in an attempt to stabilize unstable markets, so as to reduce the risks inherent in these markets for investment and product development. There are legal restrictions on such collusion in most countries. It does not have to be a formal agreement for collusion to take place (although for the act to be illegal there must be actual communication between companies) – for example, in some industries there may be an acknowledged market leader which informally sets prices to which other producers respond, known as price leadership.

In other situations, competition between sellers in an oligopoly can be fierce, with relatively low prices and high production. This could lead to an efficient outcome approaching perfect competition. The competition in an oligopoly can be greater when there are more firms in an industry than, for example, if the firms were only regionally based and did not compete directly with each other.

THE BEST IT-STARTUPS IN UKRAINE

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What does the word "startup" mean? Startup is the development of a new business-idea or beginning of the new business stream. There are many startups in the IT-area that are evolving like mad. For example, companies like GOOGLE or FACEBOOK, that have been only search systems of separates universities, but they managed to become popular and helpful internet sites for everyone.

What do we need to know to begin a startup? Firstly, you should be an innovator: to have an unusual and interesting idea to entertain or help people. Secondly, you have to create the best business plan. Thirdly, you must look for people who are ready to help you in your hard work toward a goal. Fourthly, you should work out your idea to the stage of the finished product. The next point is to explore the world market to know your competitors as well as demand for your product. If you successfully finished all these stages, you will begin to advertise your innovation and, of course, sell it.

It goes without saying, all experienced startupers have many pieces of advice for young beginners. For example, if you have a cool idea but are not confident in it, you will ask some people on forums and websites. And remember, when you realize your idea, you will invest your profits into advertising. It is important because your future income will depend on the number of your startup users.

It is well known that Ukraine takes the first place in the world in the number of certified IT-specialists per one thousand inhabitants. Some Ukrainian startups have proved themselves abroad and have received large investments from foreign companies. For example, Petcube is a robot that can be the best toy for our pets. It is equipped with a camera, speaker, microphone and laser pointer. Of course, many people did not understand this idea, but this startup was among the winners at the Macworld conference organized by the Apple.

So, why does the modern world need to know about startups? Do we need to support our national startups to make Ukraine the most developed country in the world?

ECONIMIC AND SOCIAL CHALLENGES OF UKRAINIAN SOCIETY

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The problem of economic growth is one of the most important today in Ukraine. Economy is a basis of well-being. The economy is a determining factor in the development of the state. Nowadays, there are so many changes in the world's economy. Economic growth of the well-developed countries slows. Our planet is on the threshold of the new economic era. According to scientists, the next step is introduction of the complex of the nano-bio-info-cogno-technologies (NBIC). For usual economic understanding it means that manufacturing of the materials and commodity will be cheaper. Social consciousness of Ukrainians predisposes our country to the highly intellectual labor. The optimal economical model of Ukraine is robotized manufacturing and educationally directed society. It will give us more possibilities especially in future. We can get the highest level of the technological growth of economy, but for this we should make special conditions for the specialists of nano-bio-info-cogno-technologies (NBIC). Development of the education and possibilities for its application is a main challenge of the Ukrainian economy. Only highly-technological economics can withstand competition in the global economic area. We should trade commodities with high level of the manufacturing processing, for example computers, medicines, microscopes, airplanes and other. It can be realized by making low-tax zone for high-technological companies in Ukraine. Easy registration and management of business, simple and clear rules of the game, low level of corruption in the inspection bodies is the key to success and prosperity of our country. We should use all our possibilities, the potential of highly-educated people and they will make our country one of the most-developed countries in Europe and all over the world.

ADAPTATION OF LEGISLATION OF UKRAINE TO THE EUROPEAN UNION LEGISLATION IN THE FIELD OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

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Ukraine chose the way of European integration, finally confirming the intentions, when signed an Agreement about Association between European Union and Ukraine on June,27,2014. To meet the obligations Ukraine should implement the adaptation of national legislation including energy efficiency and renewable energy to the European Union.

Ukraine, as one of the Contracting Parties of the Energy Community must implement the following EU directives in its legislation:

• Directive 2006/32 / EC of the European Parliament and of the Council of 5 April 2006 on energy end-use efficiency and energy services, as well as repealing Council Directive 93/76 / EEC.

• Directive 2010/30 / EU of the European Parliament and of the Council of 19 May 2010 on specifying the consumption of energy and other resources to energy products by means of labeling and standard product information.

• Directive 2010/31 / EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings.

Today, Ukraine has not completed the implementation of directives and legislative approximation, but has made significant steps to do this:

- Ukraine has approved its Energy Strategy until 2030 and is developing the draft of Energy Strategy of Ukraine till 2035;

- The Law of Ukraine "On amendments to some laws of Ukraine to ensure competitive conditions for the production of electricity from alternative energy sources" is approved;

-the State Target Economic Program for the development of energy efficiency and energy production from renewable energy sources and alternative fuels for 2010-2015 is implemented;

-the National Action Plan on Renewable Energy for the period until 2020 is approved;

-the draft decree "On National Action Plan on energy efficiency for the period till 2020" is approved.

However, despite the already taken steps, Ukrainian economy remains one of the most energy detrimental: energy consumption of gross domestic product per unit is three times larger than the average energy consumption in the countries which are the members of the Organization for Economic Cooperation and Development.

The legislation for the entire implementation of Directive 2006/32 / EC on energy efficiency usage and energy services has to be changed according to such laws as "On the effective use of energy resources", "On Amendments to Some Laws of Ukraine regarding mandatory commercial accounting and improving relations in the housing and communal services " and " Energy Audit ".

Directive 2010/30 / EU on the labeling of products to energy requires the development and approval of Technical Regulation of the energy labeling of televisions and Technical Regulation of the energy labeling of household air conditioners.

For the implementation of the provisions of Directive 2010/31 / EU on the energy performance of buildings Ukrainian Parliament should pass a law "On the energy efficiency of residential and public buildings."

CLASSIFICATION OF PACKAGING FOR FOOD AND GOODS

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Packaging is an integral part of food and goods.

Packaging provides safety products that comply with sanitary and aesthetic requirements, standards, ease of use and sales and promotes the competitiveness of products, protects the rights of producers and consumers in the market.

In many countries, the package received much attention, as both product.

Rational use of food depends on the organization prior packaging and food packaging.

Pre-packaging of goods can significantly reduce the cost of packaging materials in the sales network.

Packaging can be classified by many signs of her properties. Approximate classification as follows:

1) functions in the commodity circulation;
2) frequency of use
3) membership
4) functionality;
5) the method of manufacture;
6) design features;
7) the physical and mechanical properties (resistance load);
8) resistance to external influences;
9) material manufacturing (container type);
10) the type of packaging;
11) the type of sealing tools and aids.

For the functions performed during the circulation of commodities package is divided into transport, consumer and packaging equipment.

1. Transport packaging (external) is used for transportation and storage of goods. It forms an independent transport unit;

2. Consumer packaging (internal) comes to consumer goods. It includes vials, bottles, jars, tubes, cups, bags, and more. Its cost is included in the price of goods and high-end buyer.

3. Packaging equipment is a product designed for stacking, transport, temporary storage and sale of goods tion.

4. Guild packaging is intended to group of goods inside the company (trays and boxes special design).

5. Preserving used for long term storage of raw materials, intermediate goods and products.

Depending on the amount of packaging used is divided into single, reusable and returnable.

1. One-time packaging intended for single use in the supply of goods. This includes most consumer packaging.

2. circulating is the packaging that was already in use, but reused.

3. reusable packaging designed for multiple use, and usually return it to the supplier (boxes, bags, tubs, etc.).

Depending on the accessories isolated containers general and individual use.

For the design of the containers are classified as folding, collapsible, disassembled complex, closed, opened and stacked.

With physical and mechanical properties of the container is divided into rigid, semi-rigid, soft and fragile.

Depending on the footage manufacturing container divided into wooden, cardboard, paper, textile, metal, glass, ceramic, polymer and composite.

Since there is a great variety of goods, there is a large number of types of packaging. Thus there was a need to develop a standardization system for containers establishing common requirements and standards.

Standardization of containers will reduce packaging costs by improving process performance packaging, transportation and assembly of products. Simplified and lowers the cost of production of the packaging.

CONTACTLESS, OR THE FUTURE OF PAYMENTS

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Technology is the present world. It affects people's daily lives and touches almost every sphere of our being. The field of finance isn't an exception.

Payment card was created as the 'key' to the consumer's bank account, whether it is a deposit, a loan or a stored value (prepaid). Cards can be used to 'unlock' and transfer your money to the merchant. Well, there is a fact that the payment card is 'the treasure key'. Do you really want to give it to someone else?

When processing a credit card transaction in almost all stores today, you must give the seller your card because of the way of payment via terminal. While using contactless payments you don't have to give anybody your card (basically, there's no rule that you shouldn't have your card with you), that means that these transactions are safer.

What does it mean to pay contactless?

When you see the special symbol that means you can pay this way, touch your card on the reader to pay. The reader confirms your payment. Of course in our high-tech world, you can easily use your phone with support for this type of payment instead of the card. After launching the payment application on your phone and entering the card information, the phone is tapped on the credit card terminal and a connection is made using NFC (Near Field Communication).

NFC is a short-range high-frequency wireless communication technology commonly used in contactless cards and mobile phones.

As electronic transactions via mobile phones or tablet devices continue to rise, the companies that provide services on these devices have been quick to offer a variety of payment transaction types for their customers.

Currently, there are many well-known companies, which joined the contactless payments popularisation. For example, Apple, Samsung, Google, VISA, MasterCard, American Express, PayPal and others have already revealed their products for contactless payments.

By integrating these solutions into the largest payments ecosystems, financial institutions can provide consumers the ability to conduct any transaction in any place with any conditions.

The mass market introduction of contactless technology is an important event for the whole payments industry of the world. Contactless payments are already providing benefits to consumers and retailers alike, in terms of higher levels of control and comfort for consumers and higher throughput for retailers. And these benefits are just the tip of the iceberg.

When you think about the most innovative countries of the world, the U.S., Japan and South Korea often come to mind. Frankly speaking, Ukraine is still far from these technological giants. According to Bloomberg's 2015 ranking of the world's 50 most innovative countries, our country ranks 33rd.

In conclusion, it is hoped that Ukrainian companies, which are connected with the payment industry, will review further ways to increase the availability of contactless payments.

PROS AND CONS OF GLOBALIZATION'S ECONOMIC IMPACT ON INSURANCE MARKET OF UKRAINE

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In modern society, the relationships between individual countries become closer, and the role of liberalization as a process of breaking barriers between the autonomous economies is growing.

Under such conditions, the development of insurance market in any country is impossible without considering international financial market trends, including the global insurance market. The continuous growth of international trade, foreign direct and indirect investments consequently lead to capitalization and concentration of insurance capital, increased competition between large multinational insurers, foundation of strategic alliances between companies, establishing a single international insurance legislation, etc.

Accordingly, the insurance market of Ukraine could not escape the globalization processes influence. Despite the fact that our country joined the international insurance market later than other countries, the process of globalization has already made a certain impact on its development. Liberalization is aimed on establishing an optimal balance between the integration of the national insurance system to the global one and those mechanisms, which prevent the outflows of capital. These mechanisms primarily include the following: diversification of insurance types, unification of insurance principles, increase of domestic insurance companies' capitalization, presence of foreign insurance capital in the national market, extension of domestic insurers to foreign markets.

In general, global trends of insurance companies' development, particular in Ukraine, can be described as successful. Today there are numerous foreign insurance companies and companies with foreign capital in Ukraine, represented by 30 countries. The largest share in total amount is the capital of Great Britain, Northern Ireland, USA, Poland, Cyprus, the Netherlands, Russia and Austria. The Allianz, Generali, AXA, PPF, Wiener Städtische, Viennalnsurance Grou, UNIQA, Fortis, BTA, RGS have been already operating in Ukraine. In addition, a large number of

insurance brokers successfully run their business here. Particularly, according to the latest figures of the National Commission for State Regulation of Financial Services Markets, there are 6 insurance and/or reinsurance non-residential brokers, who reported about intention to work in Ukraine. They are: the reinsurance broker «Talanx Reinsurance Broker Aktien-gesellschaft» (Germany), reinsurance broker «Greenstone insurance and reinsurance broker» (Latvia), an insurance and reinsurance broker «GrECo JLT Ukraine GmbH» (Vienna), «BRUNO SFORNI SPA» (Italy), «Reunion AG» (Swiss Confederation), «MARINE UNDERWRITING SERVICES SIA» (Latvia).

Today, there is no common view on the role of foreign investors on the national insurance market. There are both positive and negative aspects of this issue.

To the positive one, we can refer the possibility for Ukraine to attract inflow funds from abroad in the form of foreign investment for the development of both insurance business and economic system in general. Another positive feature of the foreign insurance companies' entrance may be an expanding range of insurance services, improving their quality through competition and, as a result, improving living standards and business practices through the better protection against existing risks.

However, one shouldn't miss the problems, caused by too excessive opening of national insurance sector. First of all, the activities of foreign economic actors are always more difficult to monitor and regulate by the state, than domestic ones. Therefore, there is a risk that governance may lose its control over the insurance reserves and investment funds, if foreign investors dominate on the market. Moreover, the success of foreign insurance companies often results in termination or bankruptcy of domestic enterprises. In that way, foreign insurance companies or large corporations displace less developed domestic businesses.

Thus, there are both advantages and disadvantages of foreign insurance companies presence in the domestic market of Ukraine. However, in the context of globalization trends, foreign capital is inevitable for our economic system.

SECTION 5 SOCIAL AND LINGUISTIC CHALLENGES

NECESSITY OF THE JUDICIAL REFORM IN UKRAINE

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The Cabinet of Ministers identified key areas of the amendment concept of judicial reform in the Ukrainian Constitution. The content of these changes is the transition to three-tier system of courts, the determination of the court network by the law, the creation of a single collegial body. The concept of this body includes the selection, career and responsibility of judges, as well as a complete personnel rearrangement of the judiciary based on a transparent competitive basis. According to the President of Ukraine, amendments to the Constitution of Ukraine concerning judicial reform also include the abolition of judge immunity and simplified system for their dismissal from the office.

In 2010 the judicial system has undergone several changes:

- the Supreme Court of Ukraine was deprived of the cassation obligations, that don't correspond with the Constitution of Ukraine;
- there was adopted the Law "On Judicial System and Status of Judges", which provided judges with immunity;
- the judicial power got under control of the political power, in particular, of the Presidential Administration.

To make the judicial reform effective, it is necessary to solve a number of tasks for the "returning" of the judicial power in Ukraine:

- to make amendments to the Constitution of Ukraine;
- to prepare a draft law on the implementation of justice in Ukraine in accordance with the Convention of 1950 and secure it in the Constitution of Ukraine;
- to create a judicial power based on the principle of power separation into 3 branches, according to Article 6 of the Constitution of Ukraine;
- to provide the Supreme Court of Ukraine with cassation obligations and to declare it the main court of Ukraine;

- to legislate the appointment of judges immediately unlimited according to the results of the Verkhovna Rada voting;

- to eliminate higher specialized courts;

- to deprive appellate courts of the right to return cases to the local court, instead of this to try and make decisions in the court of appeals;

- to transfer certain categories of cases, such as cases of life imprisonment, from local courts to higher courts; judicial decisions concerning serious crimes and great financial fraud should be made by judges, who have greater experience and higher professional qualifications;

- in each field the judicial power should be represented only by one person – a Chairman, who will be responsible for the activities of all courts in this area before the Plenum of the Supreme Court of Ukraine;

- to create the system of judges qualification improvement and the evaluation system of judges professional suitability; the failure of this procedure will result in dismissal of a judge from office.

As possible activity in the field of judicial reform may be appeal for advice and assistance in this reform in Ukraine to international experts. Then the results should be sent to the Venice Commission for expert opinion, and perhaps several recommendations to improve implementation of the judicial reform will be obtained; what, in its turn, will accelerate the process of reforming and at the end of 2016 – beginning of 2017 will make possible to get an unprecedented judicial power in Ukraine, capable to administer justice at the global level.

Evidence of real progress in judicial reform is the adoption of the law of Ukraine "On ensuring the right to a fair trial", the signing by the President of Ukraine the decree "On the Strategy of reforming of the judicial system, judicial process and related legal institutions for 2015 – 2020" (from 20.05.2015). According to the decree, the Plan for realization of the Strategy of reforming the judicial system, judicial process and related legal institutions for 2015 – 2020, has been developed and approved by the Council on judicial reform. However, on the basis of the developed normative-legal acts the Cabinet of Ministers of Ukraine should determine the mechanism of this Plan realization and, annually, by April 1, report on the process

of its implementation. If these conditions are fulfilled, the judicial reform will effectively take place in Ukraine.

FOREIGN LANGUAGE IS YOUR CHANCE TO SUCCESS

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Knowledge of foreign languages is the key to success in the modern world. Learning a foreign language is not an easy thing, but a long and slow process that takes a lot of time, energy and efforts. Nowadays it is especially important to know foreign languages. English is an international unit of communication but it does not reduce the degree of importance of studying other languages. English sometimes defines the fate of the people and even saves lives. What is its significance? It is simple to answer, languages give more independence in the world. Everyone is trying to learn the language in order to improve their future and for several practical purposes:

1.Career. Indeed, almost all organizations with foreign partners consequently require negotiations, contracting, signing contracts, etc. all this is carried out on the international language. One can always freely communicate with business partners, participate in international conferences, read international magazines and newspapers about business.

2. Education. Actually, for modern young person knowledge of foreign language makes it possible to study in prestigious foreign universities. Because the popularity and prestige are the main selection criteria for admission. The graduators of foreign universities can get international diplomas, it enables to get a decent job around the world and gives a great chance of success in life.

3. Trips abroad. Young people want to travel abroad and see many different countries and cities, to learn the culture and customs of other nations. The important point is that it is a great opportunity to plunge into the world of mysterious and to communicate with people of another ideology, religion, race and mentality.

Free knowledge of another language enables a deeper understanding that should benefit not only the person but also the country, the exchange of information achievements in various fields of life, culture and customs. As a result it allows a closer cooperation between countries and a better international communication.

SOME PRINCIPLES OF LANGUAGE TEACHING

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Any scientific approach to language teaching uses scientific information; it is based on theory and a set of principles which are internally consistent. It measures results. It is impersonal, so that it can be discussed on objective evidence. And it is open, permit¬ting cumulative improvement on the basis of new facts and experience.

The following principles are necessary and sufficient to define the scientific ap¬proach. Stated briefly here, they are devel¬oped into practical teaching programs in suc¬ceeding chapters. The principles are subject to change or elimination as new scientific facts are added to our knowledge.

Speech before Writing. Teach listening and speaking first, reading and writing next. This principle is the basis for the audio-lingual approach.

Basic Sentences. Have the students memorize basic conversational sentences as accurately as possible? This practice, advocated by linguists, has a strong psychological justification not dealt with in published experiments but tested repeatedly otherwise.

Patterns as Habits. Establish the patterns as habits through pattern practice. Knowing words, individual sentences, and/or rules of grammar does not constitute knowing the language. Talking about the language is not knowing it. The linguist, the grammarian, and the critic talk and write about the language; the student must learn to use it.

Sound System for Use. Teach the sound system structurally for use by demonstration, imitation, props, contrast, and practiced.

Vocabulary Control. Keep the vocabulary load to a minimum while the students are mastering the sound system and the grammatical patterns. The attempt of many students to concentrate on learning vocabulary at the beginning is mis-guided. Linguistics shows that words, no matter how many, do not constitute a language.

Teaching the Problems. Problems are those units and patterns that show structural differences between the first language and the second. They will be illustrated in later chapters. The disparity between the difficulty of such problems and the units and patterns that are not problems because they function satisfactorily when transferred to the second language is much greater than we suspect. The problems often require conscious understanding and massive practice, while the structurally analogous units between languages need not be taught: mere presentation in meaningful situations will suffice.

Writing as Representation of Speech. Teach reading and writing as manipulations of graphic representation of language units and patterns that the student already knows. When standard spoken utterances differ from their graphic represen¬tation, it is due to inadequacy of the writing system.

Graded Patterns. Teach the patterns gradually, in cumulative graded steps. To teach a language is to impart a new system of complex habits, and habits are acquired slowly.

The Student. Age, educational level, capacity, handicaps, level of proficiency, goals, and linguistic and cultural background are significant variables with regard to the student.

Educational Level. Language teaching must obviously differ for literate and illiterate students. It must also differ for various levels of education, with the college or university level and the primary education level sharply distinguished.

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KOMMUNIKATIONSMEDIEN FORSCHER UND JOURNALISTEN «LIEGT» IM PUBLIKUM

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Massenmedien spielen in der modernen Welt eine wichtige Vermittlerrolle zwischen den Informationen und dem Publikum. Um ihre soziale Rolle erfolgreich erfüllen die Medien um die Geschmäcker und Vorlieben des Empfängers zu orientieren. In diese Probleme kann man Medienforschung Praktizierenden Journalisten zu helfen. Nachdem alle theoretischen Kenntnisse und Erfahrungswerte sind zwei Seiten der gleichen Medaille der sozialen Kommunikation.

Das Problem des Verhältnisses von Theorie und Praxis des Journalismus war und ist im wissenschaftlichen Bereich relevant. Insbesondere in der deutschen Wissenschaft auf das Thema des Verhältnisses von Theorie und Praxis Journalismus sind viele Experten in der Massenkommunikation: Otto Groth, Peter Hals, Claudia Mast, Klaus Shonbah, Wolfgang Rudolph Langenbucher angesprochen.

In der deutschen Wissenschaftsraum ist keine integrierte und umfassende Studie, die theoretische und praktische Aspekte unterbreitet und sind keine Empfehlungen für die Verbesserung der Arbeit der praktizierenden Journalisten. Es gibt eine wissenschaftliche Notwendigkeit, die komplexen Beziehungen zwischen Journalismus und mediadoslidzhen zu verstehen. Nach der Praxis der Medien und Medienforschung sind zwei Systemstruktur im Journalismus.

Also, wie kombiniert Praxis der Medien und Medienforschungsstudien und welcher ist ihren Verhältnis?

1. Wegen der Krise der Medienmarkt gibt es einen Bedarf für neue Zeitungsarten.

Die Krise der Presse ist nicht nur wirtschaftliche, sondern struktureller Art. Der neuen Medienepoche ist klassische Zeitung, wie es seit Jahrzehnten war, nicht mehr so eine interessante modernes Publikum gemacht. Auf dem Mediamarkt ist ein starker Konkurrent, die Nachrichten verteilt schnell und kostenlos - Internet.

2. Das Publikum ist eine Kommunikationsverbindung zwischen Journalismus und Medienwissenschaften.

Die Erforschung Geschmacks und Vorlieben des Publikums ist der Schlüssel zum wirtschaftlichen Erfolg Publikationen. Die Medienforschungen sind Werkzeuge für diese Erforschung.

3. Das Problem der Journalisten ist, dass sie nicht wissen, die echte Bedürfnisse und Vorlieben des Publikums, eine echte journalistische Unwissenheit.

Journalisten kennen nicht ausreichend über soziologischen und statistischen Methoden zur Untersuchung die Meinungen seine Publikum. Sie haben oberflächliche Verständnis für die wirklichen Ansichten und Vorlieben des Publikums.

4. Die oben beschriebene Situation führte zur Bildung einer neuen Art des Journalismus - Journalismus Anpassung und Medien Marketing.

Der Ziel diesen neuen Art ist die Versuch des Wider sprüche zwischen den Ansichten der Redakteure der Medien und dem Publikum die wirkliche Lage der Dinge zu erkennen.

Medien bilden die Werte und Präferenzen des Publikums, aber es muss eine Rückmeldung. Das ist einzige Möglichkeit, um den notwendigen Ausgleich zu erzielen.

5. Die Kraft der Medien zeigt im Wettbewerb. Nicht auf die Bedürfnisse der Zielgruppe werden angepasst nicht den Medienmarkt Kampfes stehen.

Wenn das Medium in der Lage ist mit einer ähnlichen Medien zu konkurrieren, ist der Fokus auf das Publikum auf der entsprechenden Ebene.

6. Für Journalisten Erfolg in der Zukunft muss man der Wunsch der Leser zu nehmen.

Die Befragung die Redakteure von Tageszeitungen und Zeitschriften, die von den Forschern Mast, Popp und Taylor hat gezeigt, dass 61% denken, so Redakteure und 54% der Führungskräfte Zeitschriften.

7. Die Journalisten müssen bei ihrer täglichen Arbeit notwendigerweise die Medienforschung benutzen, als Garant für Professionalität.

Die Analyse der Wirtschaftsmagazine in den 70er Jahren des zwanzigsten Jahrhunderts zeigten eine geringe Wirkung auf den Leser Führungs Medien bei der Gestaltung der Strategie Funktionieren Veröffentlichung.

So in der journalistischen Praxis Kenntnisse über die Besonderheiten ihres Publikums führt eine äußerst wichtige Funktion - um für den Verbraucher anzupassen. Weil die Medien als Vermittler zwischen Informationen und das Publikum hat, seine Mission auf einem hohen Niveau zu erfüllen. Ein Medienforschung sollte als Kompass für die berufliche Tätigkeit eines jeden erfolgreichen Media zu dienen.

COMMUNICATION STRATEGIES

V.S. Kurochkina – Sumy State University

In the course of learning a foreign language, learners frequently encounter communication problems caused by a lack of linguistic resources. Learners use communication strategies (CSs) to overcome these problems. CSs help students to fill gaps when their language skills are limited. CSs also allow students to overcome challenges they face while communicating and help them negotiate meaning with their partners. S.P. Corder defines a CS as "a systematic technique employed by a speaker to express his (or her) meaning when faced with some difficulty."

There are lots of CSs. Here are some of the commonly used:

Circumlocution. This refers to learners using different words or phrases to express their intended meaning. For example, if learners do not know some word they may paraphrase it by saying it in their own words. Guessing games are very helpful in this strategy; Semantic avoidance. Learners may avoid a problematic word by using a different one, for example substituting irregular verbs with the regular ones. The regularity of verbs makes it easier to use them correctly; Word coinage. This refers to learners creating new words or phrases for words that they do not know; Language switch. Learners may insert a word from their first language into a sentence and hope to be understood; Asking for clarification. The strategy of asking an interlocutor for the correct word or other help is a communication strategy; Non-verbal strategies. This can refer to strategies such body language, gesturing, head nodding, eye contact, etc.

Video is a great way to promote self-monitoring.

The more advanced the learner's language ability, the more advanced the strategies become. Eventually, students can use strategies that they normally use in their first language, such as asking for clarification, asking for repetition, interjecting, getting time to think, interrupting, commenting, paraphrasing, describing, asking for assistance, checking questions for understanding, etc.

Students should be aware that native speakers use many CSs, which are not specifically intended for foreign language learners.

Communication strategies have been proven to strengthen speaking skills and are an important tool for language learners.

THE MAN WHO MAKES THIS WORLD BETTER

M.Maliuha, Sumy State University, Em-51
O.R.Gladchenko, EL Adviser

To tell the truth, I will tell you not only about innovations but about a man, who invents them. We watched a movie about a famous entrepreneur and engineer. I was very impressed by his story. To cut it short, I want to tell you about Elon Musk and his activity.

Elon Musk is a business magnate, engineer, inventor and investor. He has a lot of awards and recognition such as the innovator of the year, the entrepreneur of the year, the laureate for the most significant achievement worldwide in the space industry and one of the most influential people of the 21st century.

He is an owner of three companies. Musk is the General Director and Chief Technology Officer of Space X, the chairman of Solar City and the General Director, the Head of the Board of Directors and a product architect of Tesla Motors.

Tesla Motors' first production vehicle, the Tesla Roadster, was an electric sports car. The Roadster was the first highway-capable electric vehicle in serial production for sale in the United States in the modern era. The Tesla Model S is the first plug-in electric vehicle fleet to reach the 1 billion electric miles milestone. Model X is the safest, fastest and most capable sport utility vehicle in the history. This model is designed with safety as the first priority. Tesla received a 5 star safety rating. Falcon Wing doors articulate smoothly up and out of the way, allowing passengers to enter from both front and rear directions.

The Model 3 had a name of Tesla Blue Star in the original business plan. Tesla expects to promote it in 2016. According to the design chief Franz von Holzhausen, the Model 3 will "be an Audi A4, BMW 3-series, Mercedes-Benz C-Class type of vehicle that will

offer everything: range, affordability, and performance with a starting price of US $30,000" that is targeted toward the mass-market.

In 2012, Tesla Motors began building a network of 480-volt fast-charging Supercharger stations to facilitate longer distance journeys in the Model S.

The initial network was planned to be available in high-traffic corridors across North America, followed by networks in Europe and Asia.

Musk has continued his work in attempting to make his innovative ideas a reality. In August 2013, he released a concept for a new form of transportation called the "Hyperloop," an invention that would faster commuting between major cities while severely cutting travel time. Ideally resistant to the weather and powered by renewable energy, the Hyperloop would propel riders in pods through a network of low-pressure tubes at speeds reaching more than 700 m/ph. Musk noted that the Hyperloop could take from 7 to 10 years to be built and ready for use. And now, the Hyperloop seems to have an opportunity to unite cities at almost triple the speeds of a Maglev Train.

Musk invented special battery for controlling the whole home. Powerwall is a home battery that charges using electricity generated from solar panels when utility rates are low, and powers your home in the evening. Home solar installations consist of a solar panel, an electrical inverter, and now a home battery stores surplus solar energy for later use.

Powerwall will be produced in 2016 and requires installation by a trained electrician. Reserve yours today and you'll be contacted in early 2016 to arrange installation.

According to Jon Favreau, the director of the film "Iron Man", Elon Musk has served as the prototype of Tony Stark. In 2010, Musk appeared in the movie "Iron Man 2" as himself. In the film he met Tony Stark in a restaurant, and had some brief lines regarding an "idea for an electric jet".

I think that he is a real iron man of nowadays.

USING ELECTRONIC DEVICES FOR STUDENTS' INDEPENDENT WORK IN HEURISTIC LEARNING

S.V. Mikhno, teacher of foreign languages department,
Sumy State University

Modern education turns to independent, creative and online strategies.

Heuristic learning requires a great deal of students' independent creative work and self management. Online learning lets students choose the most suitable time and pace of studying. That's why we use a set of online materials, useful web links and online training tests for independent students' work that are given at teacher's personal web page and available 24/7 via the internet.

This makes the access to learning materials easier and wi fi connection on campus helps to facilitate studying. Although wi fi connection at Sumy State University is not always available, it still gives the opportunity for students to get these materials. They just need to use their personal mobile devices, such as telephones, tablets, laptops etc.

We widely create and use online training tests for independent out of class work. Students can train at home or everywhere where they want, when they have time, desire and the internet connection. The experience of using such tests shows that they should be shorter (about 10 items). It's a good idea to divide big complex tests into smaller subtests. Analysing feedbacks on such tests we notice that a lot of long tests (that include about 30-60 items) turn to be unfinished.

Online electronic materials give great opportunities for studying but also require the improvement of teacher's professional level in managing them. Not every teacher is a web programmer and the system *LecturEd* at Sumy State University is a helpful tool for them.

So, *LecturEd* allows teachers and students to create, store, use and access learning materials with the help of their electronic devices. These materials are always at hand, you just need to have the internet connection and an electronic device.

PROFESSIONAL MOBILITY OF MEDIA COMMUNICATION STUDENTS AND ROLE OF FOREIGN LANGUAGES

E. Shcherbak – Sumy State University, MDm-51
S. Zolotova – E L Adviser

The Ukrainian system of higher education is one of the most active to meet the challenges of the modern world. The processes of integration into the European area changed its teaching approaches, making the competency building approach a leading one. Development of key integrative and professional skills trains future specialists to solve correspondent issues within their working field successfully.

The modern labour market demands constant improving of professional knowledge and mastering new techniques and adjacent professions that, by far, are the components of professional mobility. Thus, forming of university students' professional mobility is of top priority.

The issue of professional mobility was considered by many scientists in different fields. Among the most popular are the papers of L. Goryunova, Ye. Zeyer, B Igoshev, L. Merkulova and L. Sushchentseva. In their works L. Merkulova and O. Starshynova lay special stress on foreign languages as an efficient tool of professional mobility.

There are many different definitions of "professional mobility". After B. Igoshev, professional mobility is an integral quality of a personality, its ability to change a professional status, positions and to move professionally under personal knowledge, needs and qualities [1:89].

The development of communicative technologies implies oversaturation of modern media landscape and its constant integration. New professions, connected with information dealing and distribution, appear on the labor market, giving opportunity to new specialists and making them move forward professionally in order to meet challenges. That is why a foreign language is of great importance for a future media worker. The foreign language enables access to world sources of information and allows building international bridges between national media spaces.

The main modern method of teaching foreign languages is a communicative one, enabling communication as an aim and means of teaching. On the one hand learning of foreign languages develops such cognitive operations as analysis, synthesis, abstracting, concluding, etc. On the other hand, the following three components allow efficient professional mobility:

- motivational and cognitive, concerned with the motivation development towards professional experience. Motivational element stands for the desire of self-actualization in the professional area, while a cognitive one employs striving to obtaining knowledge and expanding perspectives;
- organization and activity, aimed at formation of skills, necessary in tackling the professional tasks of media sphere workers;
- social and communicative involves knowledge possession of professional space and ethics as well as adaption to it.

Taking into consideration the above-mentioned, the effective means of professional mobility formation are the next:

- role-playing games that concern modeling professional situations and teaching business communication, cooperation in a staff as well as efficient problem solving;
- multimedia presentations and report preparing: by doing this students are training the skills of effective monologue, experiencing communication on the level addresser – addressee;
- roundtable discussions that gives the knowledge and ability to use masterly both language and target professional knowledge.

Participating in conferences, webinars and seminars is an integral part of forming the students' motivation towards professional development and, thus, foreign language mastering.

In conclusion, it is necessary to underline the urgency of modern media specialists to their professional development when the knowledge of foreign languages is a must-be. Efficient teaching of it will give an opportunity of quick and progressive professional mobility.

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PATRIOTIC SLOGANS IN SUMY COMMERCIAL ADVERTISING

K. R. Smirnova – Sumy State University, group RK-31
S.V. Mikhno – EL Adviser

Advertising text effectively sells the product or service. A catchy slogan motivates consumers to future purchase. Moreover, successful slogan will always be on everyone`s lips or even will transform into an aphorism.

Encouraging customers is categorical and expressive in advertising slogans of our sity. Rarely it is based on the specific advantages of product, but rather on emotions. Slogans often relate their significance to the national, family, financial, spiritual, youth and European values. It should be said that, nowadays the factors of national and European values have become dominant in commercial advertising slogans of Sumy.

The importance of manufacturing country has been increased for Ukrainian consumers. So, the current trend is to highlight that the product is of Ukrainian origin. In addition to this, we can see that it is extremely popular to indicate the origin of product in slogans. Especially it concerns so called home-made commodities. For example, the external advertising of toilet paper «Ruta» focuses on exceptional tenderness of their product, the slogan says: «Ніжне, бо рідне» (English variant – "Soft, because native"). The watchword is «Час купувати українське» (English variant – "Time to buy Ukrainian").

Outdoor advertising of «EKOmarket» appeals to «Купуй українське!» (English variant – "Buy Ukrainian!"). On the poster the branches and flowers are schematically depicted, the style of this picture imitates «petrykivka». The dominant colors of advertisement are blue (writing and drawings), and yellow (background of commercial). In the slogan «EKOmarket» used direct appeal to the patriotism of consumers. As well as the notion of a patriotism includes love and respect to everything that is somehow connected with the homeland. [1]

Furthermore, V. A. Minakov believes that a broader concept to the concept of patriotism is love and loyalty. He defines patriotism as «awareness of the subject his own love, devotion to the motherland, which is based on the image of a fair, acceptable to the majority of the motherland population and activity which is directed

on preservation and progressive development of the motherland» [2]. Therefore, both advertising that we have analysed appeal to patriotism in their slogans.

Another example of patriotic slogan is the slogan from «Semki»: «Живи жовто-блакитно!» (English variant – "Live Blue and Yellow!"). Advertisers verbalize Ukrainian national colors, they urge consumers to a particular style of life. Short and catchy slogan helps to remember the brand. In a competitive environment «Semki» is one of the best recognizable brand of sunflower seeds. The yellow and blue campaign helps «Semki» reserve their place on the market.

Multinational brand «Persil» presentes new outdoor advertising in Sumy. It is a laundry detergent made by Henkel which is quite popular in Ukraine. The image of Ukrainian blouse along with a bottle of detergent is represented on the one of Sumy citylights. The watchword is «Persil пишається бути серед найкращих» (English variant – "Persil prouds to be among the best").

The slogan of the advertisement is: «Найкращі речі завжди в тренді. Як і Persil» (English variant – "Best Things are always in fashion, as well as Persil"). Due to this slogan «Persil» is high-quality and good commodity, it is «the best». As far as the bottle of it stands near the vyshyvanka, the positive meaning of national cloth affects «Persil».

As a result we can say that appeal to patriotism in the slogans of commercial advertising in Sumy has imperative request. Imperative slogans dictate their own conditions to the consumer. Thanks to the use of imperatives advertisers often achieve their main goal – to sell. Nevertheless, we discuss various examples of patriotic slogans. Emotional and categorical commercial advertising slogan should excite patriotic feelings in the target audience. Slogan is an essential part in advertisement, so use it effectively.

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ANTI-CORRUPTION ACTIVITIES IN UKRAINE METHODS OF STRUGGLE WITH CORRUPTION IN FOREIGN COUNTRIES

E. Pronsky- Sumy State University, group U-41
E. V. Pronyaeva- Adviser

Reducing the level of corruption to the maximum safe, in particular in Ukraine, is possible only provided the study and implementation of foreign experience of struggle against this very negative social phenomenon.

In the USA for candidates for service, as well as for police officers at all levels set high moral standards and tough rules of conduct and discipline. A stringent selection of candidates for service, which provides a check on the lie detector. The Federal Bureau of investigation, one of the main tasks of which is to combat corruption, practiced constant movement of employees from one section to another to minimize the possibility of merging with the local authorities and organized crime. We think it would be appropriate to pay particular attention to the issue of staffing in law enforcement bodies of Ukraine, the candidates should check the same efficient methods that have been working in the United States. In order to maximize the reduction of corruption in Ukraine among law enforcement officers it would be reasonable constant movement of these employees from one working place to another.

The peculiarities of fight against corruption of countries that have proven themselves on a global level as the safe level of corruption, there is a desire to actively resist corruption and instant response from the state on corruption, why, in my opinion, Ukraine should learn; the relevant legal framework, which should create a Ukrainian state on the example of the legislation of the most experienced countries in the field of combating corruption; involvement in anti-corruption work of social organizations, on behalf of the people interested in the lack of corruption in the country in the first place.

We would like to create in Ukraine an Agency that will deal exclusively with the fight against corruption, especially in the higher

echelons of power and to refer cases to the anti-Corruption Prosecutor's office of Ukraine. Such an Agency should function on the example of functioning of the Nolan Committee, which monitors corruption processes in the UK and is one of the most efficient of anticorruption agencies worldwide; service Central France on the fight against corruption, charged with centralizing the information necessary to identify active and passive corruption, abuse of official position by public servants and private citizens, bribery, actions in the mercenary purposes. Joint anti-corruption actions of such agencies in Ukraine and the anti-corruption Prosecutor's office to quickly give a tangible result.

We want to start anti-corruption efforts in our country from the highest echelons of power and set of representatives of the government the most severe sanctions in case of corruption such as the fight against corruption in Israel, where significant social benefits for officials and their merciless punishment upon detection of corruption, local corruption is virtually absent.

The analysis of peculiarities of fight against corruption crimes in Japan, Singapore, South Korea, Italy, USA and other countries can form the main points advanced anti-corruption strategy, the development of which is necessary in today's Ukraine. It is a strong political will of the country's leadership to fight corruption and formed on the basis of the unified state policy in the field of combating corruption, which would include a complex of measures for the state, political, economic, social and legal nature. It also organized social control by civil society over the whole system of public administration (prerequisite for this is to create an atmosphere of transparency) and provided the possibility of excitation in this framework, the prosecution of offenders. Important here is the role of a truly independent media. The next basis is the hard accountability of those vested with public powers, in front of a really independent body responsible for monitoring the cleanliness activities of public servants, and invested with the authority to prosecute officials, regardless of their place in the hierarchy of power. These provisions may constitute the basis for a successful national anti-corruption policy in Ukraine.

ARBEITSMARKT UND BERUFSCHANCEN IM JOURNALISMUS DES DEUTSCHLANDS

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M. M. Dunajewa – Senior Lecturer

Der Arbeitsmarkt und die künftigen Berufschancen für Journalisten hängen von der wirtschaftlichen und medienpolitischen Entwicklung ab. Die weltweite Konjunkturkrise im 2001, der Zusammenbruch des Marktes, die gründlichen Kursrückgänge und die regressiven Werbeinvestitionen schwächten die Medien. Die Folgen waren erhebliche Personalreduzierung.

Die Medien haben sich davon bis heute nicht erholt, obwohl große Konzerne wieder Rekordergebnisse berichten. Der Deutscher Journalisten Verband berechnet für das Jahr 2012 auf 72.500 hauptberufliche Journalisten. Hinzu kommen etwa 3.000 Volontäre und 26.000 freie Journalisten zur Arbeit.

Auch im 2014 erhöhte die Zahl der arbeitslose Redakteure und Journalisten. Sie vermeldete 5304 Personen. In den letzten 7 Jahr ist die höchste Zahl.

Die Statistik des weltweiten Portals „Statista“ zeigt, dass im 2013 Deutsche Fernsehen und Tageszeitungen bevorzugte. Das ist 36,9 Prozent und 22,7 respektive. Aber im 2014 veränderte sich die Situation und das Publikum bevorzugte das Radio und Internet, dabei Fernsehen und Tageszeitungen verloren besonders ihre Positionen nicht. Die Zeitschriften blieben auf dem letzten Platz.

Heute müssen Journalisten mobil sein, um angemessen auf dem Arbeitsmarkt zu bleiben. Die Journalisten der Gegenwart und Zukunft erwarten Cross-Wissen und Fähigkeiten: die Vermischung zwischen Journalismus und digitaler Technik, Unterhaltung, Werbung, PR, dabei noch soziale Netzwerke zu verwalten.

Die Zukunft, die das „Statista“ für den klassischen Journalismus prognostiziert: bis 2020 zahlreiche heutige Tageszeitungen werden nicht mehr erscheinen; Print wird drastisch an Bedeutung verlieren; es wird deutlich weniger Journalisten nicht geben; journalistische Produkte werden für den Leser deutlich teurer nicht sein; der Journalismus wird besser als heute nicht stehen.

SWOT AND PEST ANALYSIS

D. Telegina - Sumy State University, Group AMm -51
S.V. Podolkova – EL Adviser

When planning a project it is important to learn about the internal and external factors that can affect the project. There are some excellent strategic planning methods that you can use to analyze all these factors. SWOT analysis and PEST analysis are two of the most frequently used planning methods.

SWOT means analyzing the:

Strengths – The advantages you have over the competition concerning this project.

Weaknesses – The disadvantages you have internally compared with your competitors.

Opportunities – Current external trends, which are expected to be taken advantage of.

Threats – External movements, which may cause a problem and have a negative impact on your business.

Sometimes SWOT is referred to as SLOT, where weaknesses are named as liabilities. By working through each of these points, it is possible to identify any internal disadvantages or advantages, which could benefit or hinder the outcome of a planned project. This method is also able to identify the external factors, which could also make a difference to the success or failure of a project.

Knowing this information it is possible to plan a successful project that is ready to work around certain problems effectively and to avoid failure. It is a good idea and excellent practice to work through the SWOT analysis with a team in the early stages of project planning. Brainstorming is a great way of introducing all the relevant internal and external factors for each section of the analysis.

PEST stands for the analysis of the external factors, which is beneficial when conducting research before beginning a new project or when it is necessary to help conduct market research. These factors are:

Political – Laws, global issues, legislation and regulations that may have an effect on your business either immediately or in the future.

Economic – Taxes, interest rates, inflation, the stock markets and consumer confidence - all need to be taken into account.

Social – The changes in lifestyle and buying trends, media, major events, ethics, advertising and publicity factors.

Technological – Innovations, access to technology, licensing and patents, manufacturing, research funding, global communications.

Pest can also be known as PESTLE which includes other factors such as:

Legal – Legislation which have been proposed and may come into effect and any passed legislations.

Environmental – Environmental issues either locally or globally and their social and political factors.

Unlike SWOT this strategy is more directly aimed at the external macro environmental factors that might be affecting the position of a business, the reasons of growth or decline in the market, and it also identifies new directions for the business.

It is never enough, just to have the information to hand. What is really vital, that is the way the analysis is used in order to boost profits, to be sure a project is successful and to identify areas of opportunity which could transform the business for the better.

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THE ROLE OF FOREIGN LANGUAGES IN MODERN WORLD

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T.M. Kosova - E L Adviser

Knowledge of foreign languages - is the key to success in today's world, where communication in foreign languages and processing large amounts of information is becoming increasingly important. Nowadays knowledge of foreign languages plays an important role in the person's career, political and economic spheres of life. Possessing a foreign language, a person automatically goes to a higher social degree, as highly competitive member for any post either in one of the most prestigious foreign company or he could have active partnership in our country. International business and diplomatic relations are conducted in principal languages. There are six world languages that mainly play a key role in the world economic and political systems: English, Spanish, French, Russian, Chinese and Arabic. They are recognized as the official languages of the UNO.

Learning a foreign language has been and remains an integral part of modern professionals' formation process. European language policy focuses on multilingualism. It is simply impossible in modern world without this successful integration. National interests of Ukraine require the identification of Ukraine as an influential European country, full-fledged EU member. Studying in educational institutions with more than one foreign language is in the interests of overall national policy of Ukraine, because today our country is on the path to European integration and close cooperation with the countries of the European world, which is not possible without language skills.

The proficiency in English plays an important role in international relationships, because this is the official language of

international business and commerce, Internet and technology, science and arts. More and more multinational companies are mandating English as the common corporate language—Airbus, Daimler-Chrysler, Fast Retailing, Nokia, Renault, Samsung, SAP, Technicolor, and Microsoft in Beijing, to name a few—in an attempt to facilitate communication and performance across geographically diverse functions and business endeavors.

November 16, 2015, the President of Ukraine Petro Poroshenko signed a decree according to which 2016 year is announced as the Year of English language in Ukraine. Given the role of English as a language of international communication, to promote its study, to expand public access to the world's economic, social, educational and cultural opportunities offered by the knowledge and use of English, ensuring the integration of Ukraine into the European political, economic, scientific and educational space in support of the program Go Global, which defines learning English as a prior development strategy, in order to create opportunities for Ukrainians to use this language in education, science, culture, economy and other fields.

So, this year, in Ukraine will reveal new opportunities for learning English. Hope, in the nearest future every Ukrainian, living in new European country, will know English thoroughly.

STUDYING IN EUROPE – WHAT IS IT LIKE?

M. Yousupova – Stockholm School of Economics in Riga
T. Plokhuta – E L Adviser

The author of the paper is a student at the Stockholm School of Economics in Riga, as well as the Sumy State University. The Stockholm School of Economics in Riga (SSER) is a Swedish higher education enterprise, which is based in Stockholm (Sweden), Riga (Latvia), and St. Petersburg (Russia).

Students at SSER are conducted no more than 3 courses at once, which enables making trainings in each very intensive. The language of instruction at the school is English. Some disciplines are tutored by more than one lecturer; many lecturers are practitioners: some own their businesses or work in real economic sector.

Seminars, in contrast to lectures, are held by students – teaching assistants (TA's). For Year 1 students, Year 2's or Year 3's lead seminars. There is no material remuneration for this type of work; it is entirely voluntarily. What TA's gain is experience, better expertise in a particular course, and good reputation in the eyes of the lecturer. Regardless absence of material incentive, teaching assistants take their job seriously, and they put much effort so that students deliver the best academic results possible.

Another distinctive feature of studying at SSER is intensive adoption of online systems. The e-learning platform is an integral part of education at the school. Most of tasks are submitted online; lecture slides, additional information regarding readings, etc. is available on the platform, as well. The submission of tasks online implies a significant strictness of deadlines – up to seconds.

Students at SSER do not pick courses for their curriculum. Nonetheless, there is such a concept as "electives" – those are courses that a student can choose according to his will. The range for choice is represented by a broad variety of courses – from languages and philosophy to Excel Advanced and Business Correspondence.

What is more, the bachelor's degree program lasts 3 years, and most of the disciplines are related to what is actually pursued by students – the BSc in Economics and Business. In other words, there

are no such subjects as History or Culture of Tibetan tribes (just as example) in the curriculum. Hence, students have an opportunity to really concentrate on relevant courses. Majority of the papers (research and reports) that have to be submitted are closely related to what is studied and are helpful in deepening knowledge in specific areas and modern trends in the today world economy.

It is not only the way of education that makes the school and learning at it special; it is the rigorous rules and dedication to high standards. How is it achieved? On the first place, benchmarks are never compromised: if half of the student body fails an extremely harsh course, it means that those 50% will be re-taking the exam at specifically assigned time for it; however, it by no means suggests that the exam might be too tough, and the course, as well as the exam, will be reconsidered for the next year. Additionally, plagiarism is frowned upon and rigidly punished here extending to considerable fees and dismissal from school!

What makes the school special is tight cooperation among its organizational parts: administration is an intermediary between students and lecturers. To avoid any corruption, lecturers are not even present at the exams; there are supervisors in examination rooms. Students come for tests only with their student ID's; they also have to put their signature on sign-up sheets on entering and leaving the auditorium. Students are preliminary randomly divided into groups of 10-15 people for each exam separately, and each group is assigned to a specific room. The system is designed to avoid cheating and plagiarism, as well as any possible bias in supervising the examination process.

In conclusion, several points should be stressed. It is the discipline that makes education here special. In this paper, only a particle of the educational system in the school has been revealed. It takes hard work, transparency, and regulation to achieve such results; nevertheless, in some time in the future, Ukraine will be able to compete with prominent European schools, implementing straightforward and candid educational system.

CONTENT

Наукове видання

З ІНОЗЕМНИМИ МОВАМИ ДО ВЗАЄМОРОЗУМІННЯ, КРАЩИХ ТЕХНОЛОГІЙ ТА БЕЗПЕЧНОГО НАВКОЛИШНЬОГО СЕРЕДОВИЩА

МАТЕРІАЛИ X ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ

лінгвістичного навчально-методичного центру
кафедри іноземних мов

(Суми,24 березня 2016 року)

WITH FOREIGN LANGUAGES TO MUTUAL UNDERSTANDING, BETTER TECHNOLOGIES AND ECOLOGICALLY SAFER ENVIRONMENT

Materials of the tenth all Ukrainian scientific practical student`s, postgraduate's and teacher's conference of Linguage Centre of the foreign languages department
(Sumy, March, 24, 2016)

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