



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

МАТЕРІАЛИ

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

«TO MAKE THE WORLD SMARTER AND SAFER»

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"TO MAKE THE WORLD SMARTER AND SAFER"

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To Make the World Smarter and Safer: Матеріали XIV всеукраїнської науково-практичної конференції студентів, аспірантів та викладачів Лінгвістичного навчально-методичного центру кафедри іноземних мов СумДУ (26 березня 2020 р.) / за заг. ред. доцента Литвиненко Г.І. – Суми : СумДУ, 2020. – 106 с.

У матеріалах подані тези XIV Всеукраїнської науково-практичної конференції студентів, аспірантів та викладачів Лінгвістичного навчально-методичного центру кафедри іноземних мов СумДУ. До збірника ввійшли наукові дослідження, присвячені актуальним проблемам сучасних інноваційних технологій та процесів у науці, техніці та різних сферах людської діяльності.

Для молодих науковців, викладачів і студентів усіх факультетів.

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SECTION 1 INFORMATION AND ENGINEERING TECHNOLOGIES

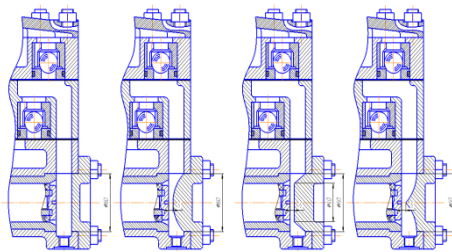
REDUCTION OF HYDRAULIC LOSSES IN A PISTON PUMP

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The hydraulic losses are the decrease in energy of the fluid due to vortex formation, friction between the fluid and the pipe, changing the flow of fluid. The decrease in energy of the fluid, in turn, leads to the following consequences: decrease efficiency, increase energy consumption and decrease cavitation stock pump.

The main danger in a piston pump is to reduce cavitation stock. This leads to boiling of water by pressure reduction and rapid destruction the flow part of the pump. One method of improving the pump was the reduction of hydraulic losses by improving the flow part. For improving the flowing part instead of a pocket that is standard form it was suggested that these shapes (fig. 1): area, sphere, trapezoid and cone.



carried out with the help of software product ANSYS SFX, where it has been identified the hydraulic losses and illustrated the flow of liquid and vortex

Figure 1 - kinds of caps formation.

After analyzing the data determined that with a temperature of 200C when injecting the smallest loss figure has a cone shape that has the hydraulic losses 0,414 m. And during the suction that has loss 0,292 m. At a temperature of 700C during injection it is best proved by the figure of a trapezoid with losses 0,459 m. And during the suction with losses had 0.301 m. But if we consider the pressure losses during suction and discharge in

the pump, when pumping liquids 20⁰C using cone hydraulic losses would decrease by 3% in comparison with the standard pocket. If pumping hot liquid you need to use a trapeze, despite her loss, which in sum will give a reduction of hydraulic losses by 1%. compared to the pocket.

PLANE CODING DEVICE

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While designing a fault protection device, one of the most important tasks is to ensure the high reliability of the transmitted data with the highest possible speed at the lowest possible cost. In order to accomplish this task, it is necessary to use codes capable of detecting and correcting an error. To achieve noise immunity, a combinatorial plane code is often used.

Analysis revealed a number of advantages when using a plane code, one of which is the possibility of detecting and correcting an error at any point of the plane of the combinatorial coordinates system. In the predicted code, the number of control characters k is equal to the number of coordinates, and the total number of information symbols m is the number of combinations k to 2:

$$m = C_k^2 = \frac{1}{2} \cdot k(k - 1) \quad (1)$$

where m is the number of information symbols, k is the number of control characters.

There are two modes of operation in the designed device, and depending on the number of obstacles encountered in the channel, one of them is used: $k = 7$ (mode I) and $k = 4$ (mode II). Using (1) we calculate that the maximum number of information symbols $m = 21$ (mode I) and $m = 6$ (mode II), respectively.

For heavily noisy channel mode I is used. It is characterized by a higher level of noise immunity than in mode II. If the channel is relatively noiseless, the mode II is used, which is characterized by a higher data rate.

The plane encoder corrects only one-time errors. As for errors of different multiplicity, it can only detect them. Malfunction signals are analyzed for their frequency of receipt and subsequent selection of the transmission mode.

The analysis showed that the use of plane code is optimal for transmitting information with the high speed and the high level of protection against errors.

A USAGE OF GRID-TECHNOLOGY FOR MODELING PHYSICAL PHENOMENA IN MODERN SCIENCE

M. Kharchenko – Sumy State University, group PM – 91
S.V. Podolkova – EL Adviser

It is well known that modern scientific problems are very complicated and can not be solved by pen and paper without computers. The main reason for usage computer resources is a lot of equations need to be solved and huge amount of data need to be used for corresponding computations.

Nowadays scientists use HPC clusters (high-performance computing cluster) for solving their complicated scientific problems instead of low productive PC (personal computer). HPC clusters consist of several computation nodes connected in one cluster through fast local area networks. Each node is a specialized HPC computer with extended memory and consists of several high performance processors operating in parallel manner. A computer cluster may be a simple two-node system which just connects two personal computers. It may be a very fast supercomputer. A basic approach to building a cluster is that of a Beowulf cluster which may be built with a few personal computers to produce a cost-effective alternative to traditional high performance computing.

Computer clusters may be built for different purposes. A general purpose for business needs web-service support, a purpose for simulations of physical phenomena is in computation-intensive scientific calculations. In case of extremely complicated problems

when user should operates with huge amount of data the solutions of corresponding scientific problems can be done by using parallel or grid-computations. This procedure is based on a usage of grid-cluster like one supercomputer. This supercomputer is composed of different HPC-clusters connected with each other through Internet. In this case we get supercomputer which consists of a lot of big volume of memory and big set of high performance computers. The parts of grid-cluster are located around the world in one or different countries and are independent on each other. They are only connected through a network. This technology is used to calculation of the difficult tasks requiring significantly computation resources. The reason to create this procedure for computation process was emerged when the biggest laboratories of scientific research (CERN in Switzerland, ORNL in the USA) were out of needed computation memory and resources.

Nowadays each scientific institute or University has its own HPC clusters to perform numerical modeling of physical and chemical processes. Every country with developed scientific power has one or several grid clusters. In Ukraine the most of academic institutes connect their HPC clusters into National Ukrainian Grid supported by National Academy of Science of Ukraine. For example, in Institute of Applied Physics located in Sumy city the HPC cluster is connected into Ukrainian National Grid network. This cluster is used by scientists of this Institute and scientists from other institutes in Ukraine and other countries over the world.

BIOFUTURE

A. Kravchenko – Sumy State University, group IN – 92
I. A. Morozova – El Adviser

Today I would like to tell you about magnificent invention with a huge potential humanity came up with recently. The team of scientists from University of Vermont, Tufts and Harvard University have constructed a first-ever robot entirely out of living

cells.

They named the invention as “xenobots”, because they are made of heart and skin cells harvested from embryonic African clawed frogs (*Xenopus laevis*). Basically, they are submillimeter-small blobs containing between 500 and 1000 cells built in lego-like way with the help of supercomputer and complex algorithms.

Xenobots can move and live on their own nutrients up to one week, after this period they simply become a pile of dead cells. This is their “environmental” advantage over metal and plastic brothers. What’s more after recycling xenobots can enrich the soil with their organics or even become future oil.

Xenobots are living beings and completely organic, their DNA is 100% frog’s DNA, but still they cannot be attributed to any known life form or species. These robots create their own “programmed life form”. However, it is impossible for them to reproduce or evolve on their own. At least for now.

Another amazing thing about these tiny wonders is they are self-organized and can easily work in groups to move objects in one place. So of course, the most important point in an area of their application is medicine. And the most obvious purpose is targeted drug delivery, which raises the question of using them as a bioweapon. The ethics and limits of this field of research is yet to be considered.

Evaluating dangers is surely important but let’s concentrate on positive things for now. Xenobots can help to clean up environment, remove microplastic from the oceans and work in areas hostile to humans. For example, they also can reduce radioactive pollution and work with nuclear waste, recycle it or even, in theory, enrich it back. But, in my opinion the most interesting usage of xenobots is terra-forming. Theoretically they can morph the environment on our and other planets. Which will help us in an upcoming expansion to Mars.

APATITE-BIOPOLYMER MATERIALS AND COATINGS FOR BIOMEDICINE

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The use of materials with osteointegrating and bactericidal properties is an important dental strategy.

For this purpose, methods for the manufacture of composite material in the form of a film based on hydroxyapatite and natural polymer (alginate) with the addition of inorganic ions and the subsequent saturation of drugs and active substances were developed and investigated.

The main theoretical prerequisite for the use of dental implants is the fact of tissue integration with the incorporation of biologically inert materials into the jawbone. Dental implants are inserted into the bone instead of the lost tooth and remain for the next 3-4 months or six months. This time is required to heal the implant with bone.

Osteointegration is a biological phenomenon that means implantation of the implant with a living bone. At this stage again the bone tissue germinates into the surface of the implant, a good bonding between the implant and the bone is obtained.

Currently, the main materials used for the manufacture of implants are industrial grade titanium, titanium-aluminum alloy.

It has been proven that the only material that has demonstrated biocompatibility during long-term studies and grows with bone is the Ti-6Al-4V alloy.

Advantages of this or that implant systems are a constant topic of discussion, however, there is a tendency for more widespread use of osteointegrated implants with previous “engraftment” without loading of the intraosseous part of the implant, which usually has a porous surface.

The purpose is to develop the latest biopolymer-apatite materials for dentistry.

To achieve the goal, the following tasks are set:

- studying of the influence of physical parameters of natural polymers on the patterns of synthesis of composite materials based on hydroxyapatite with specified structural characteristics;

- obtaining bioactive materials based on natural polymers and hydroxyapatite for dentistry;

- studying of morphology, structure and properties of bioactive materials for dentistry.

To study the morphology of coatings, their phase and elemental composition, raster electron microscopy, X-ray spectral and X-ray structural analysis were used.

In carrying out the set tasks within the project modern instrumental methods and methods of research of the received materials were applied.

The results of the study of the structure, phase composition, morphology of the surface of the coating based on hydroxyapatite, which is applied to the implant surface by the method of thermal deposition.

The advantages of such coatings:

- rapid osteointegration with a high bone-implant clutch, especially in conditions of low bone density.

Disadvantages:

- the risk of loss of coverage due to resorption, especially during large augmentation, immediate implantation, use of platelet-rich plasma (PRP) in peri-implantitis conditions.

The obtained coatings are of interest for use in clinical practice as biocoating on titanium implants, which are currently undergoing clinical trials.

So, the use of materials with osteointegrating and bactericidal properties is an important dental strategy. This project proposes technological approaches for the synthesis of nanostructured materials in the form of synthetic CDGA films for their further use in dentistry.

NANOTECHNOLOGY IN OUR LIFE

O.Mandryka - Sumy State University, group MB-91

I.A. Morozova EL-adviser

We live in a time of great development. However, most people do not even think that we can all contribute to the development of certain industries. The development of nanotechnology is now very important for humanity and no one can even predict what we can reach in the future with the help of it.

The term "nanotechnology" should be understood as one of the fields of scientific and engineering disciplines investigating processes occurring on an atomic and molecular scale. Nanotechnology involves manipulating materials and devices of very small sizes much smaller than we are used to. Nanoparticles are generally assumed to be of sizes from 0.1 nm to 100 nm.

Back in 1986, futurist Eric Dressler painted an image of a utopian future in which self-replicating (i.e. self-replicating) nanorobots do all the work society needs. These tiny devices are able to fight different human diseases making people virtually immortal. Nanorobots can also move freely in the environment, making them indispensable in combatting pollution in the environment.

Nanotechnologies are expected to provide a significant breakthrough in computer technology, medicine, as well as in military affairs. For example, medical science has developed ways to deliver drugs directly against cancer tissues in tiny "nanobombs." In the future, nanos can "patrol" arteries, countering infections and providing diagnosis of diseases.

Nanotechnologies are already used in the production of hard drives of personal computers, catalytic converters - elements of internal combustion engines, tennis balls with long service life, as well as highstrength and simultaneously light tennis racquets, tools for cutting metals, antistatic coatings for sensitive electronic equipment, special coatings for windows providing their self-cleaning.

ROBOTICS

Kate Vinnik - Sumy State University, group IN-93
O.R. Gladchenko - E L Adviser

Robotics is applied science that is responsible for the design, development, construction, operation and the use of robots and also for the computer systems which are necessary for the robotic control and sensory feedback based on output signals from the sensors and information processing of automated technical robotic systems.

Robots are of great use in human life nowadays. They work in places where people cannot work. As more and more robots are designed to perform individual tasks, they must be classified.

Some robots are designed for severe work (medical manipulators), others handle heavy objects (cranes, elevators, lifts).

Therefore, all robots can be classified according to their appointment, motor apparatus and the way of reading information.

As for the appointment and the format of performed work robots can be classified as technological (industrial), aid (shipping) and universal.

As for motor apparatus they can be classified as wheeled, walking, swimming and flying robots.

According to the way of reading information robots can be with robotic sounding, touch and vision.

The history of robotics began when people realized that they could expand their capabilities and therefore made their life easier. The development of robots is only an intermediate stage in the main technical race of our time namely the invention of artificial intelligence. Everyone who produces robots is trying to give them something new, to teach them some new skills and provide additional opportunities.

Everyone should also understand that a widespread interest in robotics arises in the war time. All our seemingly familiar things were invented in times of war to help soldiers. During the war robots can save soldiers' lives with less wastage of energy and resources

KÜNSTLICHE INTELLIGENZ

Nikolaiev Yevhenii, Sumier staatliche Universität, SU-71
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Künstliche Intelligenz hat sich im letzten Jahrzehnt von einem Science-Fiction-Traum zu einem kritischen Teil unseres Alltags entwickelt. Wir verwenden Künstliche-Intelligenz -Systeme, um mit unseren Handys über Siri zu interagieren, Autos wie Teslas zu interpretieren. Künstlich intelligente Algorithmen sind hier, sie haben unser Leben bereits zum Besseren oder Schlechteren verändert. Aber das ist nur der Anfang, und eines Tages werden wir 2019 auf Künstliche Intelligenz zurückblicken und darüber lachen, wie primitiv es war.

In erster Linie sind KI-Systeme bereits darauf vorbereitet, Millionen von Jobs zu übernehmen. Jeder Job, bei dem ein Mensch Informationen von anderen Menschen herunternimmt und in ein System eingibt, wird wahrscheinlich veraltet. So sind Kassierer, Rezeptionisten, Telemarketer und Bankangestellte auf dem Weg. Da selbstfahrende Autos, selbstfahrende Drohnen und andere Förderer von A nach B komplexer werden, verlieren wir auch Jobs wie Lastwagenfahrer, Postangestellte, Kurierdienste und sogar die Lieferung von Pizza. Fabriken werden auch voll automatisiert, ebenso Autowaschanlagen und Kinos. Sogar ein Job als Journalist ist durch die schnelle Verbesserung von Nachrichtenalgorithmen bedroht, die Informationen sammeln und schneller und genauer liefern können.

Algorithmen, die gewaltige Datenmengen überwachen und verarbeiten können und auf der Grundlage von Mustern in diesen Daten Rückschlüsse ziehen, sind in der Lage, jeden Weg der Gesellschaft zu verändern. Angefangen von etwas Kleinem, wie zum Beispiel die Optimierung der Verkehrsmuster im Laufe der Zeit, um die besten Routen herauszufinden oder um Straßen zu reparieren und Autobahnen wiederaufzubauen. Etwas sehr viel ernsteres, wie das Beobachten von Epidemien und Krankheiten und das Stoppen von Krankheiten, bevor sie sich verbreiten.

Maschinelles Lernen hat sogar gezeigt, menschliches Verhalten zu analysieren und Warnsignale vorherzusagen.

Je mehr wir künstliche Intelligenz studieren und entwickeln, desto klarer wird, dass dieses enorm mächtige Werkzeug mit viel Verantwortung verbunden ist. Obwohl wir hoffen können, dass artifizielle Intelligenz unsere Gesellschaft voranbringt. Im Moment wissen wir einfach nicht, was die Zukunft bringt.

VOICE ASSISTANT

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Everyday devices become smarter. Thanks to software agent which is called an intelligent virtual assistant (IVA) or intelligent personal assistant we can use our appliances in full. Nowadays there are more than 30 different IVA, but all of them have differences. Popular voice assistants currently include Apple's Siri, Amazon's Alexa, Google Now, Google Assistant and Microsoft's Cortana.

Voice assistants are technology-based. Voice assistants are built on artificial intelligence, machine learning and voice recognition technology. These agents can interpret human speech and respond via synthesized voices. They are the point of communication between you and all your connected devices. They can perform a variety of actions after hearing a wake word or command. For example, IVA can help you control your “smart” house like to turn off light, make some coffee drinks or full bath with ideal water temperature.

Voice assistant devices bring a new, hands-free experience to our lives. By using voice assistant, you may organize and systematize your work. Voice command can be an excellent helper for you in daily life. Only by the voice you can call, message or turn the music on, in short, operate your device fully. Instead of always try to found information by yourself you may

give a command to the assistant and it runs this command at a few seconds.

The first modern digital virtual assistant installed on a smartphone was Siri, which was introduced as a feature of the iPhone 4S (2011). Then there was Amazon Echo (2014), Google Home (2016). They introduced consumers to the idea of using the voice to perform tasks. Now, it is about voice becoming a pervasive interaction mode that has more capabilities and is used more frequently across more devices and contexts.

Now practically all “smart” devices support voice assistant. With extensive use of IVA, it has a huge list of criteria. Such as intelligence, different types of supports (languages, “smart” home and etc.), private policy.

TESLA – ELECTRIC CARS

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Emissions of exhaust and crankcase gases into the atmosphere are large, that is why using cars with an internal combustion chamber is not very useful. The creation of a comfortable and less polluting vehicle is relevant. To realize this idea, purer energy is needed, it can be obtained by using electricity.

Tesla Motors Inc is a manufacturer of electric cars using electric motors. The company was founded by Elon Musk, JB Stobel, Martin Ebergardd, Mark Tarpenting and Ian Wright. The name of the company used the name of the first creator of the electric motor, Nicholas Tesla. Based on research and testing, the first Tesla electric car model was developed. It has a very simple design and the number of mechanical parts is minimized. The electric motor is powered by batteries located at the bottom of the car. The battery is an assembly of lithium-ion batteries, they can be discharged and recharged many times.

All Tesla vehicles are produced at its factory in Fremont, California, where the vast majority of the vehicle components are also made. To achieve the goal of having the safest factories in the world, Tesla is taking a proactive approach to safety, requiring production employees to participate in a multi-day training program before ever setting foot on the factory floor.

Such electric cars have gathered a large audience of fans and are successfully changing future ones. The main advantage is the preservation of the environment from harmful emissions. And comfort, safety and technology innovations delight owners with coziness.

To create an entire sustainable energy ecosystem, Tesla also manufactures a unique set of energy solutions such as Powerwall, Powerpack and Solar Roof, enabling homeowners, businesses, and utilities to manage renewable energy generation, storage, and consumption. Electric cars, batteries, renewable energy generation and storage already exist independently, but when combined, they become even more powerful – that is the future we want.

UNCANNY VALLEY

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I. A. Morozova EL adviser

Sometimes humanoid-like robots or computer characters evoke fear. This is because we know that they are only created to look like people. For example: robot Sophia looks like a real person, but it can't move naturally, it moves like a robot and sometimes it scares.

This phenomenon is called “Uncanny Valley” and it was introduced in the 1970s by Japanese roboticist Masahiro Mori. Mori loved designing robots and the more he learned, the more realistic his creatures looked. But he noticed that the simpler the robots were the more positive reaction they evoked but the more realistic or human-like they became, the more people got scared of them.

People react to static and movement things in different ways. Movement helps perception of “alive” and “sentient” but moving creatures can also give us the creeps.

Now, there’s debate around which mechanisms are behind our uneasiness around human-looking-but-not-fully-there robots. These are the top contenders:

- Mate selection
- Mortality salience
- Pathogen avoidance
- Violation of human norms
- Religious definition of human identity
- Conflicting perceptual cues
- Threat to humans’ distinctiveness and identity

But how can we avoid this phenomenon? First, we need to understand which types of robot we need: industrial or robots which can help people in everyday works. Then we need to create them, but we need to understand that every robot is only a machine, not a real person and they are only simulate feelings and human behavior.

But this problem will be more actual in our future not present.

WEIGHTLESS TRANSPORTATION OF THE FUTURE

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I.A. Bashlak – E L Aviser

English science fiction writer Arthur Clark made another prophecy. "... Maybe, we are on the verge of creating a new type of spacecraft that can leave Earth at minimal cost by overcoming the gravitational barrier," he said. "Then the current rockets will be the same as the balloons before the First World War." What is the basis for such statement? The answer can be found in the modern ideas of creating a transport on magnetic cushion.

The disadvantages of traditional modes of transport (noise, vibration, environmental pollution, increased fuel

consumption of traffic congestion, etc.) can be largely eliminated during operating intensively developed magnetic suspension trains. The feature of this trains are: wagons have no wheels, they do not have traditional traction motions and current elements. The main advantage of magnetic suspension is reduction of basic resistance to motion of train. Mass of trains on magnetic suspension at the same capacity about half the weight of a simple electric train accordingly, the power of the actuator and the energy consumption are twice smaller.

Half a century ago, a magnetic cushion was a fantasy. However, nowadays scientists in many countries are working to create a transport on magnetic suspension. The trains of future will "soar" above the ground, they seem to be "suspended" from the rails, or repelled by them, depending on which system will be used: electromagnetic suspension or electrodynamic suspension. In the first case, way is steel rails with a crew suspended from them. In the second case, the crew will go on a metal canvas which produces electric currents . Linear induction motors will be used as a traction mechanism in such trains. It should be noted that magnetic suspension started operating in the 1980s in Birmingham. However, after eleven years of operation, this train was taken off the line due to technical problems. Nowadays, transport system on magnetic cushion operates in China, connecting the center of Shanghai to Pudong International Airport. In Japan, the experimental train on the magnetic cushion MLX01 in 2003 this mode of transport set a speed record that reached 581 km / h.

The two fundamentally different methods on magnetic suspension are exploring now: electromagnetic (using gravity) and electrodynamic (using repulsive forces). In the first case, use a linear induction motor, conventional "heat" magnets with acceptable energy consumption, mass dimensions and thermal equipment. However, due to the small track gap (10-20 mm), there are a number of difficulties associated with providing increased rigidity of suspension and lateral stabilization,

complication of flight crew equipment. With electrodynamic suspension, a large travel gap (up to 250 mm or more) can be achieved with superconducting magnets. To create traction, they use a synchronous linear motor operating on the principle of interaction of a moving magnetic field created by the track winding and a constant field of excitation created by magnets mounted in the wagons.

Maglev or Magnetoplane is a magnetic suspension train that is driven and controlled by magnetic forces. Such a train, unlike traditional trains, does not touch the surface of the rail during the movement. Since there is a gap between the train and the surface of the movement, friction is eliminated and the only brake force is the aerodynamic drag force.

Reached speeds is comparable to airplane speeds can compete with air travel over short distances (up to 1000 km). Although the idea of such transportation is not new, economic and technical constraints have not allowed it to be fully developed, so the technology has only been introduced several times for public. Currently, maglev cannot use the existing transport infrastructure, although there are projects with the arrangement of elements of a magnetic road between the rails of a conventional railway or under the lane of a highway.

Currently, there are three main technologies of magnetic suspension of trains:

- on superconducting magnets (electrodynamic suspension, EDS);

Superconducting magnet - solenoid or coil solenoid made of superconducting material. The superconducting winding has zero ohmic resistance. If such a winding is short-circuited, then the electric current stored in it is stored for almost any length of time.

The magnetic field of a non-quenching current circulating along the winding of a superconducting magnet is exceptionally stable and free from ripple, which is important for a number of applications in scientific research and technology. The superconducting magnet winding loses its superconductivity

property when the temperature rises above the critical temperature T_k of the superconductor, upon reaching the critical current I_k or the critical magnetic field H_k . With this in mind, for superconducting magnet windings, use materials with high values of T_k , I_k and H_k .

- On electromagnets (electromagnetic suspension, EMS);
- On permanent magnets; it is a new and potentially most economical system.

The crew levitates by repelling the same poles of magnets and, conversely, attracting different poles. Movement is carried out by a linear engine, located either on a train or on a track, or both there and there.

Linear motor - an electric motor in which one of the elements of the magnetic system is open and has a winding, creates a moving magnetic field, and another made in the form of a guide, provides a linear movement of the moving part of the engine. Many linear engine designs are currently being developed, but all of them can be divided into two categories - low acceleration motors and high acceleration motors. Low acceleration engines are used in public transport (Maglev, Monorail, Subway). High-acceleration motors are very small in length and are typically used to accelerate an object to high speed and then release it. They are often used to investigate hyper-speed collisions, such as weapons or launchers of spacecraft. Linear motors are also widely used in wire feeders and in robotics. A major problem with designing is the large weight of sufficiently powerful magnets, since a strong magnetic field is required to maintain massive composition in the air.

Advantages include the highest speeds available on serial (non-sport) land transport and low noise. The disadvantages are the high cost of creating and maintaining a track, the weight of magnets, and the consumption of electricity.

The most important drawback of MAGLEV trains is the peculiarity of electromagnets, which provide levitation of wagons over the canvas. Non-superconducting electromagnets consume

huge amounts of energy. Using the same superconductors in the canvas, the cost of cooling them will negate all the economic benefits and the ability to implement the project.

A magnetic field created by a magnetic suspension can be harmful to road crews and surrounding residents. Even traction transformers, which are used on electrified AC railways, are detrimental to machinists, but in this case the field strength is an order of magnitude greater. It is necessary to control the gap between the road and the train (several centimeters) at high speed (hundreds of km / h). This requires extremely fast operating systems. Requires complex travel infrastructure. For example, an arrow for a maglev represents two sections of the road, which change each other depending on the direction of turn. Therefore, it is unlikely that maglev lines will form branching networks with forks and intersections.

However, despite all the complexities, the prospects of using magnetic cushioning remain quite attractive. Thus, the Japanese government is preparing to resume work on a fundamentally new type of land transport - magnetic cushion trains. According to engineers, "Maglev" cars are able to cover the distance between the two largest populated centers in Japan - Tokyo and Osaka - in just 1 hour. The current high-speed rail express takes 2.5 times longer to do this.

Not only the Japanese are engaged in magnetic cushion transport. In Germany, for a number of years, there have been their own studies on this subject, and the Germans have abandoned the idea of laying a "maglev" line between Berlin and Hamburg because of the excessive cost of the project. And in China, by contrast, there are now seriously open possibilities to include the "foggy" construction between Beijing and Shanghai in a 10-year state development plan. The Shanghai authorities have more to improve the world's only commercial magnetic rail service since that time to quickly travel between the city's two international airports. At present, trains running at a maximum speed of 430 km / h run from Pudong Airport to the banking

center. It is now planned to connect both international airports in opposite suburbs, allowing passengers to travel from one to another in just 15 minutes.

Many designs and projects are already 20-30 years old. And the main task for their creators is to attract investors. The problem of transportation itself is quite significant, because often we buy some products so expensive because a lot of money is spent on transporting them. The second problem is ecology, the third is high traffic congestion, which is increasing year by year, and for some types of transport by tens of percent.

As a promising direction for the development of transport on a magnetic cushion, both in terms of ecology and in terms of economic efficiency is convenient, transport on permanent magnets will improve these indicators.

Analyzing the ideas of engineers and scientists about levitating cars, we found no options for using inductors as engines for such a car. That's why they came up with the idea of creating a hybrid car on a magnetic cushion, with the crossing of the MAGLEV roadbed and the battery and inverters of the TESLA electric car.

VIRTUAL AND AUGMENTED REALITY

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I. Zaitseva – EL Adviser

What is virtual and augmented reality? First of all, for a better understating what these two terms mean let me give you a definition.

Virtual reality – is a simulated experience that can even be out of this world. When augmented reality is some addons to your life. Examples of virtual reality would be you with the help of technology to go out of this world (basically it has no effect on your real life). Examples of augmented reality can be some devices that would give you the opportunity to effect things in the real world.

Now that you have the basic understanding let's take a look on all the positive sides. Some amazing things that virtual reality could help us with the solving all kinds of conflicts, it can help you to relax. Also some schools have started using it for teaching their students (since you can experience things that you might never encounter in the real world). Now let's get to augmented reality. Thanks to it we will be able to be more productive in our lives and also be able to accomplish things that a human with his biology just can't. For example, about a year ago a German professor was able to a surgery to a person across the globe.

How might virtual reality affect us in the future? Are there any negative sides? Of course, there are some negative sides. They are exactly the same in both realities. The basic and the scariest is probably your brain control. Since it is able to use our nerves, people in the future would easily affect your mind. A powerful example could be commercials. As this technology has the opportunity to read our nerve signals the producers will know what we enjoy, what we dislike and what we feel.

To sum everything up I would like to say that as to any thing in this world there are obviously positive and negative sides. But in my opinion the positive sides of this tech overweigh all the negative parts. And these new technologies can be easily used in any field of our life.

FRAMING AS MEANING ORGANIZATION TECHNOLOGY

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Nowadays technology is changing faster and faster, it touches almost every part of our life. With technology comes change not only in the way we do things, but also change in how we think.

So, the issue how technology will shape our future, is of great interest for us. However, some people consider it very

simple question. They think future technologies will make people's life easier and more productive. There are many technologies that have already changed the way people live. For example, everyone has their own phone thanks to which we can communicate with each other, watch movies, listen to music, entertain ourselves. All this possible only due to technology development.

Today communication is impossible without technology. One of the most popular examples is framing. Framing is a concept that generally means the semantic framework used by a person to understand something and actions within the framework of this understanding, the integrity, within which people comprehend themselves in the world. In other words, framing is a stable structure, cognitive education (knowledge and expectations), and also a presentation scheme. Framing is a metacommunicative definition of a situation based on event-driven principles of organization and involvement in events. In the social sciences, framing comprises a set of concepts and theoretical perspectives on how individuals, groups, and societies, organize, perceive, and communicate about reality.[1]

It affects the perception of information by the audience. Very often framing is used by media, politicians and physicians to attract an audience and to distort the information, presenting it in a favorable light. This can be easily explained with an example of a half-filled glass. There are two variants: half-full glass or half-empty. And each of them sounds differently. The first sounds optimistic, the second, on the contrary, is pessimistic. So, using modern technologies like a channel of information, media often manipulate people and dictate us what to think about, how to think and how to do things.

Amos Tversky and Daniel Kahneman explored how different phrasing affected participants' responses to a choice in 1981.

Imagine that the United States is preparing for an outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative control programs for this disease have been

proposed. Assume that the exact scientific estimates of the consequences of these programs are as follows:

- if program A is carried out, then 200 people (72%) will be saved.
- if program B is carried out, then with a probability of 33.3% everyone will be saved and with a probability of 66.6% no one will survive (28%)/
- if program C is adopted, then 400 people will die (22%)
- if program D is adopted, then with a 1/3 probability no one will die, and with a 2/3 probability, 600 people will die (78%).

The same strategy to combat the epidemic (A and C, B and D, respectively) was perceived differently by the study participants, depending on in which way it was presented. When the emphasis was on a negative outcome (how many people will die), most respondents chose to take risks. And, on the contrary, if it was a guaranteed saving of the lives of 200 people (positive wording), people decided not in favor of the risky second option.[2]

So, expectations are characterized by possible outcomes and probabilities of their receipt. However, the same choice can be determined and described in various ways. For example, the possible outcomes of a situation can be described either as gain or losses, and both variants will affect people differently. This is the effect of framing as a modern technology that is actively used by people to achieve goals.

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IMPORTANCE OF DIGITALIZATION IN UKRAINE

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Digitalization is a global process of the introduction of digital technologies in all spheres of life, which leads to building a digital society. Digitalization is one of the main factors of global economic growth in the next 5-10 years. It accelerates social and economic processes making them more efficient and transparent.

Development of such digital technologies as Internet of Things, Robotics and Cyber Systems, Artificial Intelligence, Big Data, Paperless Technologies, Additive Technologies (3D Printing), Cloud and Fog calculations, Unmanned and Mobile Technologies, Biometric Technologies, identification technologies, blockchain (the list is not exhaustive and is supplemented) will change the way people do things, how machines work and how we think [3].

Nowadays, IT industry of Ukraine generates around 2-3% of GDP. One of the major issues Ukraine encounters today is a lack of digitalization, especially in small towns, where this problem is also aggravated by the lack of computer skills and information availability for the citizens [1]. Digitalization will be the main tool for achieving Ukraine's strategic goal of increasing GDP by eight times, to \$ 1 trillion in 2030, and ensuring the well-being, comfort and quality of life of Ukrainians.

The positive effect of digitalization extends to three levels:

- State;
- Business;
- Society;

At the state level, it increases information efficiency when engaging with businesses and the public. Also, it increases the productivity of government operations such as tax collection, service delivery, registry management, etc. Digitalization minimizes fraud in government services, reduces the level of the shadow economy, strengthens public confidence in public authorities through transparency and openness.

At the business level, it leads to the growth of labor productivity and increasing the efficiency of management, accelerates the automation of production processes. Digitalization also expands product channels and enables access to global markets.

For the society it enhances data sharing and speeds up access to information and knowledge bases. It also improves goods and services to meet the needs and requirements of the population.

Thus, the positive effects of the digitalization of the economy will not have to wait long. By abandoning paper processes and digitizing the components of their work, business entities will be able to reduce the number of steps previously required to operate, improve the timing of work, greatly increase the efficiency of their operations, and ultimately reduce operating costs. Digitalization of the economy will help society create a robust digital environment, optimize and scale operations, make them consistent and secure.

Digitalization makes it possible to accelerate innovation, support start-ups, implement digital technology in the every field of life. The implementation of all of the above conditions will increase the productivity of the entire economic system of the state and gain additional competitive advantages in the globalized digital world [2].

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SECTION 2 ECOLOGY, LAW AND ECONOMICS

CURRENT STATUS AND TENDENCIES OF INSURANCE COMPANIES INVESTMENT ACTIVITY DEVELOPMENT

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Today, insurance is very important for society, as it is a remedy that minimizes the negative impact of various adverse events in public life and takes preventative measures or the complete elimination of undesirable consequences of these risks. In addition, insurance companies play a significant role in the inflow of investments into the national economy, because they have attracted financial resources as insurance contributions for a long time. This can be a source of investment under certain conditions [1].

The investment activity of business entities is important for the development of any country's economy. So insurance companies are one of the largest institutional investors in market economies. Specialized non-bank financial institutions, including insurance companies, accumulate significant financial resources of the population and economic entities over a long period, which allows them to make long-term investments. The insurer's investment policy must be designed to guarantee maximum investment reliability and return, while maintaining liquidity through the diversification of assets. Thus, in 2018, the total assets of the EU insurance industry amounted to 7.7 trillion \$US or about 51% of the total financial assets of non-bank financial institutions.

An interesting trend is the change in the amount of insurance premiums in the whole world in 2008-2018.

Over the last ten years, the total amount of insurance premiums around the world has been steadily increasing, which testifies to the development of the insurance industry in the world. Europe has the highest share of insurance premiums, with North America historically ranked second, characterized by a steady increase in premiums. The same trend is typical for Asian countries, where in 2008-2018 the amount of insurance premiums almost doubled.

Comparing an estimate of the ratio of insurance premiums with GDP in Europe, we can say that the most developed insurance market is in France, where the amount of insurance premiums in 2018 exceeded the country's GDP by 5.9%. The UK possesses the second place in Europe, where the amount of insurance premiums accounted for 85.7% of the country's GDP. Ukraine is now an outsider in this indicator, since the above mentioned ratio has not exceeded even 3% of GDP in recent years, which indicates a weak development of the insurance business in Ukraine [2].

France is the undisputed leader among European countries in terms of investment portfolio size, and the amount of such portfolio of French insurance companies is constantly growing. Great Britain is in the second place, Germany - third, and Italy fourth, respectively. All of these countries are characterized by an increase in the amount of the investment portfolio, like in the whole Europe.

It is worth noting that, based on the analysis of insurance companies investment portfolio structure in Europe and Ukraine in 2018, it was revealed that among the directions of investing European companies the most demanded are corporate bonds (44.04%), and in Ukrainian – bank deposits and government securities of paper (42.61% and 26.64% respectively). This means that the sources of investment of insurance reserves become more conservative every year, that is, the main purpose of investing them for an insurance company is to save money from inflation. Investing is quite risky, because the value and return on

investment can change under the influence of many types of risks – inflation, currency, interest rate, credit, political, etc. [3].

Therefore, it should be emphasized that nowadays the issue of improving the approaches to state regulation and supervision in accordance with European practice (adaptation of the requirements of the EU Solvency II Directive), macroeconomic stabilization and increasing the standard of living of the population are urgent today, creation of conditions for intensification of investment activity of insurers, studying and introduction of world experience are urgent to significantly improve the place of Ukraine among European countries in terms of investment activity.

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THE PROBLEM WITH RENEWABLE ENERGY

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The global energy market is in the process of a transition from the use of fossil fuels to clean energy. In 2015, 19.3% of global energy consumption came from renewable sources. But until now, we cannot figure out how to store this energy effectively. For example, to power a cross-Atlantic flight for a jet, we should need a battery weighing about 1000 tons. But at the same time, we can use only 20 tons of kerosene. Now imagine what size battery is needed to power a city?

But batteries are not the only way to store renewable energy. The first thing we consider is Gravity Energy Storage. There is a strange railway in Tehachapi (California): when the wind blows, the wagon enters the mountain, and when it subsides, it rolls down. ARES technology is used to accumulate energy from sources of periodic action - solar and wind power plants. When the energy production is high (the wind is blowing, the sun is shining), wagons with the help of electric motors drive uphill - they accumulate potential energy. If energy production drops and consumption increases (evening - the wind died down, the sun has disappeared), the cars roll down, the engines operate in generator mode and transfer electricity to the network.

Scientists write that the efficiency of the system is 86%. And they add that the system:

- has a lower life cycle cost than batteries;
- relevant for arid areas.

The next is the compressed air energy storage system that is cheaper than lithium-ion batteries and also does not use natural gas, as other systems of this type do. Hydrostor Terra developed uses surplus energy from power plants to compress air, which is then stored underground in a container. The heat resulting from this compression also accumulates. At peak hours of energy consumption, when it is necessary to get energy from the storage

again, compressed air is raised to the surface and heated using previously collected heat. Hot air rotates the turbine, which generates electricity. The very principle of storing energy in the form of compressed air is nothing new, but usually systems of this type use natural gas to heat the air which reduces the overall efficiency of the method and leads to carbon dioxide emissions. Representatives of the company Hydrostor argue that the efficiency of their energy storage system is about 60%.

Also Beacon Power proposes storing energy in the form of kinetic energy of massive flywheels rotating at high speed. Massive carbon fiber flywheels with a diameter of 1 meter rotate at a speed of 16,000 rpm. So. To maintain this speed, the flywheel must rotate in a rarefied medium with minimal friction which is provided by a system of electromagnets that supports the flywheel in a soaring state.

So, we have a lot of developing technologies in this area and in the future they will help us decrease using of fossil fuels. It's good that some governments are trying to completely switch to renewable energy sources. But unfortunately, it will not happen soon.

VERTICAL FARMING: THE FUTURE OF FOOD

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In 30 years, 6.5 billion people will live in megacities (about twice as much as today), and to feed such population will be a huge problem.

As humanity grows larger, space continues becoming a crucial issue. So, things like houses, interior design, and even garden are becoming more and more vertical. But we are starting to have a large version of gardens, farms. While the field and the greenhouse take their place, this alternative retains it.

Vertical farming is the cultivation of products in vertically laid layers. In this case, soil, hydroponic or aeroponic cultivation

methods are used. Vertical farms try to produce food in difficult conditions, for example, where arable land is rare or inaccessible. This method helps mountain cities, deserts, and cities grow various types of fruits and vegetables using skyscraper-like designs and precision farming techniques.

There are four main problems in understanding how vertical farming works: 1) physical layout; 2) lighting; 3) growing medium; 4) sustainability features.

First, the main goal of vertical farming is to produce more products per square meter. To achieve this aim, crops are grown in folded layers in the tower's life structure.

Secondly, the perfect combination of natural and artificial lighting is used to maintain the ideal level of lighting in the room. Technologies such as swivel beds are used to increase lighting efficiency.

Thirdly, instead of soil, aeroponic, aquaponic or hydroponic growing mediums are used. In vertical farming, moss or coconut husks and similar non-soil environments are very common.

Finally, the vertical farming method uses various sustainability functions to offset the energy costs in agriculture. In fact, vertical farming uses 95% less water.

The big productivity in a small cultivation area is not the only advantage of vertical farming. These are some of the main benefits of vertical farming:

1. Vertical farming uses significantly less water and pesticides than traditional farming methods. Being indoors, crops are not dependent on the time of year and, therefore, give high yields all year round. Lettuce, tomatoes and green crops can be obtained through this practice.
2. Vertical farming allows us to grow crops using 70-95% less water than normal cultivation requires.
3. There is no risk of natural disasters such as storm, cold weather or droughts. Insects can't harm the plants. Moreover, the system works 365 days a year, day and night.

Nevertheless, at the same time, vertical farming has its drawbacks. The most significant of them include:

1. Bugs or insects are excellent helpers for successful growing crops on farms. But vertical farming completely eliminates them from the process, so this is done manually. In addition, manual pollination is more expensive and requires a lot of human labor, which today is not the most effective method. The workers will also have to reach each layer, this decreases employee efficiency.
2. Financial feasibility of this new farming method remains uncertain. The cost of building skyscrapers for farming, combined with other costs such as lighting, heating and labor, can easily outweigh the benefits we can get from the output of vertical farming.
3. There will be fewer jobs, as people will not need to transport crops. And as a result, many people, mainly farmers, will lose their jobs.

Nevertheless, as the final analysis shows, vertical farming is beneficial to both the consumer and the producer. In addition, it could potentially reduce all these space problems or even deforestation in future. This type of agriculture is likely to become one of the ways to get food for future generations.

TESLA CYBERTRUCK - BEAUTY IN SIMPLICITY

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Tesla CYBERTRUCK was unveiled in the November of the last year and is still being widely discussed. It is said to be a mix of utility and performance but not everyone is convinced by this statement.

Many people are concerned by its design. It is very planar and minimalistic but there is a reason for that, as the body of Tesla CYBERTRUCK is made of ultra-hard 30X steel. It cannot be stamped because it breaks the stamping press. This rigidity makes people question the safety of this truck which is not a concern

considering that Tesla is famous for making the safest cars in the world.

On the other hand, there are people are amazed by the features Tesla CYBERTRUCK has to offer. Firstly, its body is strong enough to withstand the abuse of harsh work or off-road environments. It does not scratch, does not bend and can even stop a 9mm bullet. It also has very tough glass that is very hard to shatter. Secondly, it is very cheap if compared to other trucks. Its body is basically one sheet of steel folded into a truck, which is a huge cost-saving. The fact that it is a stainless steel means that there is no need in painting it, as it already does not rust. Its glass is flat, so it is cheaper than the bent one. As every other Tesla product, it has an electric engine, so it is safer, easier and cheaper to maintain. Its battery will last longer than battery of other electric trucks considering its superior aerodynamics. Adding to it, electricity is cheaper than gas, so unlike other truck owners, the owner of CYBERTRUCK will save money in a long run. Thirdly, Tesla CYBERTRUCK has many more features that other trucks do not have. For example: an autopilot, an adjustable air suspension, a smart payload calculator, and even a solar panel that can charge up to 50km of range.

It is crucial to estimate the worth of the Tesla CYBERTRUCK rightly and not be blinded by prejudice as it may become the truck of the future we all strive to build.

MAINTAINING A HEALTHY ENVIRONMENT FOR FUTURE GENERATIONS.

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1. “The salvation of the world lies in the human heart, in the human capacity to reason, in human gentleness, and in human responsibility. We are still influenced by the pernicious and vain belief that man is the pinnacle of the universe, not just part of it ... We still do not know how to put morality ahead of politics,

science and the economy. We are still unable to understand that the only true core of all our actions - if they are to be moral - is responsibility. Responsibility is slightly higher than my family, my country, my firm, my success. ”

Vaclav Havel

2. Widespread environmental concerns have emerged recently. In different cultures, throughout historical development, there have been different religious and philosophical traditions regarding the relationship between man and the whole other natural world. In the so-called "developed" world, by far the most widespread has been the relation of ownership and exploitation. It was not until the early 1960s that the general public began to pay serious attention to the degree of destruction we are causing to the environment.

3. People understand that we cannot throw away our waste, hoping that it will disappear on its own. Obviously, everything that happens in one place has an impact on another, and whatever we do - digging mines, cutting down trees, building or cultivating land - our actions have consequences, both local and global, now and in the future. Therefore, our concern for the environment cannot be separated from the concern for humanity and must be based on the principles of equality, law and responsibility.

4. "The deteriorating environmental quality of planet Earth and the significant increase in the extent and frequency of natural disasters such as cyclones, floods and droughts greatly exacerbate human vulnerability to food insecurity, poor health, and the lack of sustainable livelihoods."

United Nations Environment Program (UNEP).

The environment has suffered at our hands, so maybe it's time to apologize to her and start correcting your mistakes?

THE RELATIONSHIP BETWEEN TECHNOLOGY AND THE ENVIRONMENT

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Our planet is in danger and if we want to continue living on this planet comfortably we must help it. With the coming of technology our lives have changed a lot, but resources have begun to decline, the environment has become deteriorated, and the climate has changed. Over time, people begun to use technology to preserve the environment.

One of the most important environment problem is pollution. There are different ways to solve this problem with technology including robots. Robotics is already a multibillion-dollar industry with its core in manufacturing automation. The market for robots that can perform basic chores such as cleaning, mowing, and vacuuming is already significant. We have a robot-cleaner DustClean, which cleans garbage in the streets and Waste Shark – this is a robot that removes garbage in the water and has a shape of a shark.

One of the best ideas of mankind is recycling. Thanks to recycling we can use the waste products for the second time or even turn them into energy. To protect the environment, we started using electric machines, and factories try changing the way they are produced so that harmful gases get into the air in less amounts.

Now we have many ideas for protecting the Earth that are quite possible to bring to life. Using advanced technology when building or upgrading infrastructure can help reduce climate-related risks. The climate-resilient technology is already being incorporated not only into the construction industry but also into business processes of many different industry sectors. According The Guardian, if even new building for the next 30 years was made with a material which absorbs carbon dioxide, humans could eliminate the globe warming pollution.

Another way where automation makes sense is the aerospace industry. Addressing the issues of the climate changes and environmental protections, pilotless vehicles, more commonly known as drones, can be used not only in the military but also used as inspection robots. Drones are used for hundreds of commercial applications as fully autonomous machines. Maritime and terrestrial drones used individually or deployed to work together can gather and store information and data to assess and monitor the quality of the environment, particularly in areas that are too dangerous to access for humans. Modern aerial vehicles whether rotor-based designs or fixed-wing versions, often flexible and able to monitor capabilities are used in a project called Global Forest Watch. The platform uses satellite and drone sourced data to track deforestation around the world in near real time.

But more generally, IT and robotics companies are also starting to use advanced AI and software programs to understand better the ways how land is used by analyzing land cover maps. These solutions help to explore how efficient the areas are that need special environmental protection. The application of Earth Cube, for instance, shows the impact of development on the Earth whether that is on the air or ozone layer. But also IoT (Internet of Things) is one way to help reduce the environmental impact of human activity. Sensor-enabled electronic devices are already helping monitor the impact of cities, collect details about sewers or air quality which is commonly used by citizens to check the air quality conditions before leaving home.

Unfortunately, our planet has a lot of problems, but it's not too late to solve these problems. That is why we use new ideas, technologies and just care about the environment.

PLASTIC AS A THREAT TO HUMANITY AND ITS ALTERNATIVE

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I. A. Bashlak – Adviser

Our civilization is built on plastic.

Plastic literally pass through our hands all day. The amount of plastic that we meet every day, not the end. Plastic has become an epidemic.

But where does all this plastic? A small part is recycled, goes to landfills, and a large part falls into the water.

Plastic trash can be found everywhere — on land, at sea and even deep on the ocean floor. Planet pollution waste plastic turns into a real ecological disaster.

The devastating consequences of plastic waste pollution of the environment evident today.

The great Pacific garbage patch - an example of a huge dump in the ocean.

Previously it was believed that 15 percent is plastic on the beaches, 15% in sea and 70 percent on the seabed. Now, however, scientists assume that at the bottom is 90 percent plastic.

In July 2016 in the Philippines held a meeting at which more than a hundred public and non-governmental organizations from around the world have developed a global strategy to tackle the problem of pollution of waste plastic.

Environmental pollution with plastic waste is a common issue, and it should be addressed through joint efforts.

Recycling a ton of plastic cost to mankind in hundreds, but not thousands of dollars, as it happens in the case when this waste dumped into the marine environment.

Improved solvents and enzymes turn wood waste into higher-quality biodegradable plastics.

Bioplastics is made from plastics derived from renewable biomass, such as vegetable fats and oils, corn starch, or biomass.

Biodegradable plastics can partially deprive us of these problems and move toward its goal of "zero waste" economy in which plastic is produced from biomass and it also transmits after use.

Recently found an innovative solution to produce plastic from cellulose or lignin, most likely, will help to get rid of these shortcomings.

Cellulose, the most abundant organic polymer on earth, is a major component of the cell walls of plants, lignin fills the space in these walls, giving them strength and rigidity.

Before the new plastics will be a product of mass use, will need to overcome many obstacles.

"GREEN" AIRCRAFT FROM FILMS

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Every year, the amount of passengers on airplanes is growing by several million people and the slogan "Everyone can fly" becomes a reality. In addition, there are different types of aircraft: wide-body aircrafts are used for transporting a large number of passengers for medium and long distances, narrow-body ones have lower passenger capacity, regional and local.

But not all modern planes are environmental friendly. During flights carbon gets into the atmosphere, which causes environmental pollution. That's why some companies try their best to solve this problem.

In February of this year, the company Airbus presented a new model of the aircraft Maveric. In this new model of the aircraft, the body is blended with the wings. This construction permits to reduce air resistance, fuel consumption and carbon emissions. Airbus estimates that Maveric can reduce fuel consumption by 20% compared to other existing narrow-body aircraft. This percentage will allow the company to contribute to

environmental protection. It is worth noting that two engines are located at the rear.

Engineers have increased the cabin area and thanks to this, passengers will be as comfortable as possible. Thanks to its unusual design, Maveric is like a plane from fiction films. The developers of the aircraft believe that the new form will make it easier to improve it in the future. Airbus is only testing a new aircraft, but it is possible that in the near future we will make flights on such aircraft.

At the moment, the environmental problem is very acute for humanity. Airbus is an example of a company that is developing new environmental technologies. The company presented not only a unique design, but also the protection of our lives in the future. The developer of this model noted that they need breakthroughs, their technologies must solve the environmental problems which are set for them.

SECTION 3 ADVANCEMENTS IN MEDICINE

CLONING CHRONICLES: FROM DOLLY SHEEP TO “COPIES OF HUMAN SOULS”

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In 1996, Scottish researchers successfully cloned Dolly's sheep. The birth of this seemingly ordinary white sheep was of enormous importance to science and divided the world into “before” and “after”.

In 1928, German embryologist Hans Spemann, together with his student Hilda Magnold, transplanted somatic cell nuclei for the first time using amphibian embryos. Several decades later, in 1962, Oxford University professor John Gerdon reported that he had successfully cloned a South African frog. In 1996, scientists at the Roslin Institute - Jan Wilmut and Keith Campbell - reported to Nature about the birth of Megan and Morag sheep, created using embryonic cells. Dolly became the first animal to emerge from another adult's body using somatic cell nuclear transplant technology.

The sheep was created from an udder cell, so it was named after American singer Dolly Parton, who enjoyed drawing attention to her lush bust. During the cloning that led to the birth of a famous sheep, of the 277 embryos survived only 29. Unlike its predecessors, created using the cells of their biological mother and father, Dolly was an identical copy of the original sheep. She had three mothers.

At first sight, Dolly seemed quite healthy. But a year after she was born, it turned out that sheep DNA had atypical changes to her actual age. A site known as a telomere has the property of becoming shorter as a living organism ages. And in Dolly, it was much shorter than it should have been. Scientists have hypothesized that since a sheep was cloned from an adult six-year-old individual, the age-related changes inherent in it have

also affected the latter's DNA. That is, Dolly was older than her actual age. Dolly had four sisters - they were cloned from the cells of the same donor sheep. They were born during 2005-2007 and have lived a completely normal life without any signs of Dolly's illness and premature aging.

In 2005, the first dog clone, the hunting dog of the breed Afghan Hound Snuppy, was born in South Korea. One puppy was born dead and another died of pneumonia shortly after birth. Since Dolly sheep's birth, scientists have successfully cloned 23 species of animals. Commercial cloning has gained popularity, especially among the stars. Take, for example, the famous actress and singer Barbara Streisand. She cloned her pet - a dog of the breed Coton de Tulear Samantha, who died at the age of 14.

The thing is, primates are biologically close to humans. So, in theory, new technology can also be used to clone humans.

In 2002, the Canadian organization Clonaid, a religious group that believed that humans were created by aliens, announced the birth of the first cloned person, a girl named Eve. However, she was unable to provide any evidence of this (or the emergence of 12 other clones reported later by the organization). In 2004, a group led by a scientist from Seoul National University who created the first cloned dog published an article in Science magazine that allegedly succeeded in cloning a human embryo in a test tube.

It is undeniable that the problem with human cloning is not only that it, like cloning primates in general, it is technologically more complex than cloning other mammals. From these facts, one may conclude that, to find out what the clones are, it is not necessary to create them using the latest technologies, you just have to look at single twins. That is why clones never repeat their predecessors exactly and can have a completely different character and personality.

The other side of the coin is, however, that technology could help people create the tissues and organs they need for the sick and even slow down aging, and infertile parents would have

a chance to raise their own children. Through cloning, humanity could also bring back to life species of animals that have died out for some reason or even dinosaurs.

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ASSOCIATION ANALYSIS BETWEEN BGLAP RS1800247-POLYMORPHIC VARIANT AND TYPE 2 DIABETES MELLITUS DEVELOPMENT AMONG NON-OBESE UKRAINIANS

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Introduction. Type 2 diabetes mellitus (T2DM) belongs to the diseases with hereditary predisposition, so both genetic and environmental factors influence its development. Recent studies showed, that the bone tissue regulates systemic glucose metabolism through the secretion of undercarboxylated osteocalcin (uOCN) into the systemic circulation. It is known, that uOCN binds to the GPRC6A-receptor and, therefore, stimulates insulin expression and secretion in β -cells, as well as increases muscles, liver and adipose tissue sensitivity for insulin. Thus, the thymine to cytosine transition in OCN gene (*BGLAP*) promoter region (rs1800247) may change the gene expression level and affect T2DM emergence.

The aim of the study was to investigate the association between *BGLAP* rs1800247 single nucleotide polymorphism (SNP) and T2DM development among non-obese Ukrainians.

Materials and methods. The study enrolled 181 Ukrainians with body mass index (BMI) value less, than 30 kg/m²: 94 patients with diagnosed T2DM (mean BMI [\pm SD] 26.18 \pm 2.16 kg/m²) and 87 control subjects (mean BMI 25.25 \pm 2.61 kg/m²) without any carbohydrate metabolism disorders. Whole venous blood was used for DNA extraction. The polymerase chain reaction-restriction fragments length polymorphism analysis (PCR-RFLP) was performed for genotyping. All statistical calculations were done using SPSS 22.0 (Chicago, IL, USA). The two-tailed P-value less than 0.05 was considered as statistically significant.

Results. The following distribution of genotypes in comparison groups was found: TT – 60.6%, TC – 29.8%, CC – 9.6% for T2DM patients and TT – 62.1%, TC – 31%, CC – 6.9% for control subjects. There were no statistically significant differences in genotypes frequencies distribution according to the χ^2 -test ($\chi^2 = 0.429$; $P = 0.807$). The link between *BGLAP* rs1800247 SNP and T2DM development was explored under dominant, recessive, over-dominant and additive regression models. The lack of association for each model of inheritance neither before nor after the adjustment to age, sex, smoking habit and arterial hypertension presence ($P_c > 0.05$ and $P_a > 0.05$, respectively) was found. Moreover, BMI was not an effect modifier ($P_a^{int} > 0.05$).

Conclusion. There was no association between *BGLAP* rs1800247-polymorphic locus and T2DM emergence among non-obese Ukrainians.

POWER THERAPY FOR THE BRAIN

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People suffering from diseases such as epilepsy, Parkinson's or Alzheimer's, are waiting for investigation of US Department of Defense. It helps through deep stimulation of the

brain with the help of electrical impulses to significantly improve the functioning of the functional networks of the brain and improve memory up to 15%.

The use of electricity in medicine has improved since the first cardiac pacemaker appeared. Implanted electrodes, which are visible in this x-ray, can deliver electric pulses known as deep brain stimulation (DBS). Such “brain pacemakers” have effectively treated Parkinson’s disease and were being tested in Alzheimer’s patients to improve memory, focus, and judgment. A Cleveland Clinic investigation of DBS to stimulate stroke recovery has shown hopeful results.

Researchers using an electroencephalograph, which allows for monitoring brain activity, as well as using the so-called transcranial stimulation with alternating current (tACS), affected the brain areas of young and old people associated with working memory (working memory is information that is temporarily stored for use in solving urgent problems).

The investigation involved 42 young people aged 20-29 years and 42 elderly people aged 60-76 years. It turned out that older brain-stimulated older people thought more slowly and less accurately than younger ones.

Neuroscientists explain this by the fact that young people have a higher level of interaction and synchronization of certain rhythms of brain waves, suggesting that the targeted effect of these types of rhythms on the brain of older people can help improve its functions.

Getting active brain stimulation, older people coped with tests to test working memory at almost the level of younger people. Moreover, this effect lasted at least 50 minutes after stimulation.

However, it is still too early to talk about the use of this discovery in medicine, according to scientists, several additional basic research should be carried out.

BIOTECHNOLOGY IN MODERN LIFE

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Scientists say that all discoveries take place at the junction of various specialties. Biotechnology is the basis of scientific and technological progress and improvement of the quality of human life with the world around him.

It should be emphasized, that the biotechnology is designed to solve the key problems of our time, using the potential of living organisms. Currently, biotechnology is divided into several of the most significant segments.

The "white" biotechnology includes industrial biotechnology, focused on the production of products previously produced by the chemical industry. The components of plastics, as well as oxidizers of the food industry, are synthesized using fungi *Candida* on oil waste. Also this branch is important in case of the nutritional problem of diabetics, which can be solved by specific foods. They have improved taste (sweet and bitter components), thanks to the fungal mycelium, which is added during the preparation.

The "green" biotechnology is more often associated with the agricultural sector and the branch of selection. Actually some herbs are already grown with the resistance to high concentrations of heavy metals. In any case, it's important in terms of environmental pollution.

The "red (medical)" biotechnology demonstrates a method of growing bone grafts from patient adipocytes grown in bioreactors. Preparations based on nanoMIP (molecularly imprinted polymers) can be used as carriers of anticancer drugs (specificity for point fragments of the molecule). Scientists have edited a gene for a neurotransmitter receptor to reduce intrusive repetitive movements in autism. This development is progressive method of disease' treating.

The “blue” biotechnology is mainly focused on the use of aquatic biota. Algae fuel is now called third generation biofuel, even could be used for airliners. Growing oil-containing algae in bioreactors is in 150-300 times more productive than growing soybeans. Green and brown algae are also used as bio-additives and components of skin care products (Laminaria, Chlorella, Phillophera etc.)

The “gray” biotechnology develops technologies and products for environmental protection. Scientists decided to grow bacteria *Bacillus subtilis natto* by nature. In particular, if the bacteria are metabolically active, they can generate smells. The area of interest is in finding a way to weave the bacteria into a fiber that could be woven or knit into other garments. Then it would fit within already established manufacturing processes, speeding up how quickly living, growing garments and shoes could be ready for consumers. There’re many projects of innovative materials that could get you swea-tier.

Biological design is engaged in the production of ordinary things from natural materials and the reduction of waste from production thanks to microorganisms. It was developed the material from algae and fungi, from which, using 3D printing technology, you can make a durable and biodegradable fabric. Therefore, we can make some ecological clothes using these technologies.

Lichens are used for painting walls and cleaning the air. Chopped and chewed pieces of them are able to be grown on the certain places. Such ‘wall-art’ can reduce the level of CO₂ and other gases in polluted cities. Talk for nothing, such global disaster destroys our atmosphere. The electrostatic properties of the web allow us to use it to attract small particles in the air, actually to create modern respirators. This is important in terms of air pollution and the greenhouse effect on the planet.

Summarizing, people differently perceive innovations in biotechnology. There are negative and positive examples of perception. However, people are afraid of introducing new

technologies. It is necessary to discuss the ethical issues of each experiment. It's needed to press the point we should know more about innovations in such branch of science as the Biotechnology.

THE IMPACT OF CHRONIC STRESS ON HUMAN HEALTH

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Most people associate stress with negative feelings. This is the physical and psychological response of the body that helps us better cope with a critical situation. The body releases hormones that speed up the heart rate and bring the muscles into full combat readiness. But chronic stress can have severe consequences.

Stress can be caused by everyday worries, problems at work, or an accidental quarrel with relatives. More serious life circumstances, such as a doctor's disappointing diagnosis, war, or the death of a loved one, lead to chronic stress. Stress affects a person's emotions, mood, and behavior. No less important, and often more serious, is its effect on the human body.

Under the influence of chronic stress, the central nervous system becomes vulnerable, which can lead to changes in behavior, cause overeating, malnutrition, alcohol, drug abuse, or social withdrawal.

In response to stress, a person breathes faster, trying to distribute oxygen-rich blood throughout the body. If you have breathing problems, such as asthma or emphysema, stress can lead to difficulties.

The heart also works faster under stress. The vessels contract and send more oxygen to the muscles to provide strength for an urgent response. This increases blood pressure. And constant hypertension in turn increases the risk of stroke and heart attack.

The muscles are strained to protect themselves from possible injuries if necessary. As a rule, they return to a calm

state. But chronic stress keeps the muscles in constant tension — it causes pain throughout the body.

Under stress, the liver produces extra sugar (glucose) to provide us with energy. But if this condition becomes chronic, the body may not be able to cope with increased glucose levels, which increases the risk of developing type II diabetes.

Excessive release of hormones, rapid breathing and heartbeat can damage the digestive system. An increased amount of stomach acid provokes the risk of heartburn or acid reflux. Stress will not cause stomach ulcers, but existing ulcers may open up.

In addition, chronic stress affects the way food is moved by the digestive system. Depending on the characteristics of the body, the consequences are diarrhea, constipation, nausea, vomiting and abdominal pain.

Stress stimulates the immune system. Due to force majeure, this works to our advantage, because it helps to avoid infections and accelerates wound healing. But over time, stress hormones on the contrary make the immune system more vulnerable to viral diseases. This, at a minimum, increases the time required for the body to recover from illness or injury.

A short-term reaction to stress in men is the release of testosterone, but from regular emotional exhaustion, its level decreases over time. This affects sperm production, causes erectile dysfunction, and can even lead to impotence. The risk of infection of the male genitals with infectious diseases also increases.

In women, stress affects the course of the cycle — menstruation becomes irregular and more painful. In addition, constant nervous exhaustion increases the physical symptoms of menopause.

Chronic stress is called the "silent killer" of the twenty-first century. Therefore, do not delay until the last moment and ignore the numerous signals that your body sends you.

HOW LACK OF LOVE AFFECTS OUR BODY

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Love may well be one of the most studied, but least understood, behaviors. There's good reason to suspect that romantic love is kept alive by something basic to our biological nature.

The biological anthropologist Helen Fisher made some investigation about this.

Experiment 1: Look in to the brain to study the madness of love

Ventral tegmental area: tiny factor near the base of the brain. Activity was found in the a10 cells which produce dopamine (a natural stimulant) and spray it to many brain regions.

The VTA is part of the brain reward system, and it is way below the cognitive thinking process, blow emotions. The VTA is part of the reptilian core of the brain, which is associated with WANTING, MOTIVATION, FOCUS, CRAVIN.

This same regions is active when an individual feels the rush of Cocaine. But romantic love is much more that a cocaine high, since you come down from a cocaine high.

Romantic love is an obsession. It possess you. You lose your sense of self, you can't stop thinking about another this other person (somebody is camping in your head).

Wild is love. The obsession can get worse when you've been rejected.

Experiment 2: looking at people who had just been dumped.

Activity was found in three brain regions

1. VTA: Same region active during intense romantic love. (you don't forget them, you just love them harder). "The less my hope, the hotter my love" Roman poet Terence.

This region of Want, motivation, focus and craving becomes more active when you can't get what you want.

2. Core of Nucleus Accumbens: Brain region associated with calculating gains and losses. Also the brain region that becomes active when you're willing to take enormous risks for huge gains and huge losses. Becomes very active as you're measuring your gains and losses of you lost love.

3. Region associated with deep attachment to another individual.

No wonder people suffer around the world and we have so many crimes of passion.

The substances of affection are oxytocin and vasopressin.

The desire for pairing is associated with two "hormones of emotional bonds" - oxytocin and vasopressin. Oxytocin is released by the pituitary gland and acts on the ovaries and testes, regulating reproduction. Oxytocin levels rise when couples watch romantic films, hug, or hold hands. In general, in men, the level of oxytocin is normally lower, with the exception of periods after orgasm, when it rises by 500%. Oxytocin promotes a feeling of intimacy and love with regular sex with one partner.

The occurrence of affection in a man gives the hormone vasopressin. This hormone is involved in the regulation of sexual constancy, confidence, dominance and in the labeling of the territory. In men, its concentration is higher.

Physical intimacy plays a huge role in a woman's life. It affects the mood, vitality and, of course, the state of health of a woman. In the absence of physical proximity, the hormonal background of the body changes. During orgasm, endorphins are released into the bloodstream. They affect not only our mood, but also the female hormonal background. In the absence of sex or orgasm, a woman may experience headaches, mood swings, menstrual irregularities, uterine fibroids, and ovarian dysfunction.

If men are single, their body still continues to produce sex hormones, which is harmful to health.

Scientists claim that single men are characterized by neurotic conditions, irritability, aggression, obsessions, mania,

phobias, a split personality and even the desire for suicide. In the throes of unspent love, they sleep poorly, abuse food and alcohol. As a crown to everything - the threat of prostatitis and dysfunction of the genital organ. Just imagine that you lay in a coma for several months and suddenly you need to run a marathon!

Romantic love is one the most addictive substances on earth.

Romantic love is an addiction.

A perfectly wonderful addition when all goes well, and a perfectly horrible addition when its going poorly. Love has all the characteristic of addiction: you focus on the person, you obsessively think about them, you crave them, you distort reality, your willingness to take enormous risks to win this person.

Love has the three main characteristics of addiction:

- a. Tolerance: you need to see more and more and more
- b. Withdrawals.
- c. Relapse.

BACTERIOPHAGES AS ALTERNATIVES TO ANTIBIOTICS

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The history of the discovery of bacteriophages began almost a century ago. In spite of the appearance of antibiotics, bacteriophages are still extremely promising. Bacterial infections are an urgent public health problem, due to the increasing of antibiotic resistance and negative health consequences. Thus, phages are currently considered as an alternative treatment, which are going to replace antibiotics.

Bacteriophages-viruses containing its own genetic program, infect and multiply in the presence of a certain bacteria. The usage of bacteriophage for treatment and preventing infectious diseases is rising. They affect only pathogenic bacteria

sensitive to them, causing an infectious disease, destroying them from the inside. However, the advantage of the bacteriophages' action is not to ruin the beneficial microflora of the body, unlike antibiotics.

Rebeca Dedrick of the University of Pittsburgh described a clinical case of a 15-year-old girl suffering from cystic fibrosis and infection with the antibiotic-resistant *Mycobacterium massiliense*. The antibiotic treatment had no effect, due to the antibiotic resistance, doctors decided to treat with bacteriophages. At the end of six's months therapy, the patient got over, the lung and liver functions improved.

Phages are not sensitive to antibiotics, high temperature, enzymes, disinfectants, but are very sensitive to acids, ultraviolet radiation, and ionizing radiation. They are available in a liquid form, in the form of tablets, coated with an acid-resistant coating.

The phage therapy is the usage of bacteriophages for the treatment of human bacterial infections. It is still one of the developing directions of medicine. Bacteriophages are used to treat gastroenterology, urology, gynecology, surgery, otolaryngology, pulmonology, infectious diseases of the gastrointestinal tract (GIT), inflammatory diseases of the skin and mucous membranes.

SMART LENSES FOR DIABETICS

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What is life with diabetes? It is an annoying control of blood sugar and injections with insulin. Using a glucometer for diabetics is the same as you check your mail box. The problem is that it becomes boring very soon, particularly for diabetics who keep active. It is time to change. Scientists in one of the South Korean institutes developed a device that combines the glucometer with ordinary contact lenses.

How does it work? The soft lenses have flexible chips with glucose sensor and LED. They measure the level of glucose in your tears. The glucose sensor is based on the sugar (glucose) oxidase enzyme and responds to an excess of glucose concentration in your tears. Then the signal goes to the LED insert, which works at a given sugar level and turns on. High level of glucose makes the LED display glow with a certain frequency.

Scientists tested their device on a rabbit successfully. They compared the level of glucose in blood and the result of lenses. They were equal. In addition, the rabbit didn't have any allergic reactions or vision problems.

What advantages do the lenses have? First of all, lenses are made of transparent materials and do not require charging. It seems to be perfect! Secondly, they make life of diabetics easier. Now patients and doctors can say «No» to glucometers. Without any doubt you can do your daily activities, smile, run, lenses will control everything themselves.

This item isn't available in Ukraine. Today, efforts of scientists are put in to understand how accurate lenses with glucometer for people are. If testing with people is successful, the researchers will introduce the device to global markets.

In conclusion, the idea of Korean creators seems to be quite good, because diabetes is a disease for the whole life. The technology is aimed at easing of such people's lives. It is an important step in the direction to the establishment of health's support. After all the technology is unique, they measure the level of sugar continuously, that's why a rapid rise of blood glucose can be found immediately.

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A NEW CLASS OF CANCER-KILLING VIRUSES

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T-VEC (Talimogene laherparepvec) is a local immunotherapy that contains a modified herpes virus with which a skin cancer can be cured. The invention of T-VEC can be called a breakthrough in medicine because it saves the lives of people who have inoperable stages III and IV of melanoma.

Nowadays, a traditional chemotherapy is a thing of the past therefore, a new technique for using the virus is gaining popularity. An innovative drug was tested on 436 melanoma patients with different stages of cancer (IIIB, IIIC, IIID). At the end of the study, the research team concluded that 39% of the participants had a therapeutic response to T-VEC, which means that tumors in which administered the drug, completely disappeared. Another 18% of participants showed a significant decrease in the tumor, but not its complete disappearance. Thus, it is difficult to ignore 39% of the therapeutic response, so, scientists began to improve the drug so that soon every hopeless patient could get a chance for recovery.

The action of the drug is based on the characteristic property of viruses to incorporate and then replicate their DNA in a human cell. T-VEC is injected directly into the tumor, where the modified herpes viruses infect cancer cells. They leave healthy cells because the modified herpes virus can only propagate inside cancer cells. Injection causes rupture of melanoma cells, thereby activating the immune system, which has already destroyed cancer cells independently without the help of the virus. The treatment is used every few weeks until the cancer disappears, which takes about four months. Importantly, this method is practically safe for humans, as evidenced by the fact that T-VEC is the only modified virus that the FDA has approved for treatment.

T-VEC is an oncolytic herpes virus. Two genes were removed – one that shuts down an individual cell's defenses, and

another that helps the virus evade the immune system. The drug works by replicating in cancer cells, causing them to burst. Accordingly, with T-VEC, doctors have new options when choosing the treatment. This means that they do not need to remove the tumors surgically, and this will avoid many problems and postoperative complications. Oncolytic viruses are in clinical trials treating a broad array of malignancies including melanoma, sarcoma, carcinomas of the breast, lung, colon, prostate, kidney, liver pancreas, bladder and ovary.

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SWALLOWABLE GASTRIC BALLOON COULD HELP WITH WEIGHT LOSS

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Nowadays, obesity cannot be ignored no more, it is a major factor which is harmful for our human health. This metabolic illness results from excess accumulation of body fat. Obesity increases the development of such fatal diseases including diabetes mellitus, coronary heart disease, stroke, hypertension. Curing obese patients prevents the development of complications and irrevocable changes. Current therapeutic methods are maintaining a healthy lifestyle, a medical treatment, bypass surgery.

Besides, the most effective treatment for obesity and type 2 diabetes is a weight-loss surgery. However, only 1% of obese patients eligible for bypass surgery choose to undergo it. Therefore, the invention of less invasive and efficient method of

any obesity treatment is relevant. A swallowable intragastric balloon can be introduced as an example. This technique is the most frequently used in practice and the most studied treatment.

As already mentioned, very few obese patients can undergo surgery due to high risks of excessive bleeding, infection, blood clots. The intragastric balloon technique is suitable for patients with body mass index between 30 and 40, those who cannot be a candidate for a bypass surgery or prefer less invasive approaches.

This non-invasive technique achieves a great weight reduction in obese people. Previous studies showed significant results: the mean weight loss owing to 3 months and 6 months with the intragastric balloon therapy ranged between 10.5-13.7 kg and 12-26.3 kg accordingly.

The intragastric balloon treatment offers a minimally invasive and effective method for curing obesity and complications. Nevertheless, it is possible not to lose great weight or to regain it after any weight-loss surgery. That's why it is important to follow the recommended lifestyle changes.

DANGEROUS OF HEAVY METALS SPREADING IN THE ENVIRONMENT AND THEIR EFFECT ON UTERUS

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One of the problems of our century is the unfavorable environmental status. Among the large spectrum of pollutants, special attention is paid to the effect of heavy metal salts pollution. These chemical elements in background concentrations can be found in all layers of the ecosystem. Moreover, most of these microelements are essential for the functioning of the organisms. However, when heavy metals enter the body in high concentrations, they may obtain their toxic properties. This may lead to different disorders on the tissue and cellular levels, in particular: imbalance of enzymatic metabolism, antioxidant

system, inflammatory response, genetic apparatus, etc. Besides, the results of their interaction with the body can't be fully predicted due to the variety of chemical elements that pollute a particular territory. It should be mentioned that some correlations between the metals may occur -intensify or weaken the effect of each other. That is why the influence of each separate chemical element on the body will have the other pathogenetic links than their complex effect.

The list of heavy metals that present in Ukraine (in high concentrations) is long, but the most common elements are zinc, copper, manganese, iron, lead, and chromium. At the same time, physiological concentrations of zinc, copper, manganese and iron help to maintain homeostasis, while lead and chromium are dangerous even in the very low concentrations. Based on the abovementioned, while entering the body, the abnormal concentrations of these chemical elements may develop pathological changes in the organs, without a complete understanding of pathogenesis and treatment tactic.

At the same time, in the medical area, particular attention is paid to the improvement of diagnostics and assessment of the pathological processes in the organs of the reproductive system, in particular in the uterus. This organ has specific functional properties and complex structure. That is why any imbalance in its physiology may negatively affect on the impregnation.

When heavy metals enter the body (with food, air or water), they enter the uterus through the blood and are accumulated in it. Such influence can lead to the functioning disorders of the normal uterus, as well as complicate the course of other pathologies. This significantly complicates the understanding of the pathogenetic mechanisms of this problem and stimulates to search for effective protective therapeutic medications.

LEFT- HANDEDNESS VERSUS RIGHT-HANDEDNESS

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I am left-handed. I always wonder why people who write with their right hands react so violently seeing me operating with my left hand and often ask such questions as «How do you do this?», «Do you feel comfortable?» So I want to figure out how left-handed children differ from children who write with their right hand.

Left-handedness or right-handedness of a child is determined by the more developed right or left hemisphere of the brain. It is interesting that a left hemisphere is responsible for the right half of the body that is it processes information that comes from the right leg, arm, eye and so on. A right hemisphere is responsible for the left side of the body. In addition the supremacy of one of the hemispheres determines the nature and temperament of the child.

A right hemisphere is called emotional and its strengths are a subtle perception of art, well-developed imaginative thinking. Left-handed children are most often very emotional and quick-tempered. When they try to solve a problem they let out their emotions and do not listen to reason because a right hemisphere processes and analyses information instantly thus forming emotional perception and visual-spatial functions.

A concept <left-handedness> has two meanings: the definition of the leading hand and a complex of all characteristics that reflect the high activity of the right hemisphere. Left-handedness in the first meaning describes a person who writes with his left hand and thus is left-handed but left-handedness in the second meaning describes a child with a leading left eye, left leg and a left-handed left arm.

Next very important point is connected with the appearance of left-handed people. There are a lot of interesting theories but the theory of inheritance seems the most probable at

the moment. The birth of a left-handed child is more likely in a family where one of the parents is left-handed. This applies not only to parents but also to distant relatives. This feature can be transmitted through many generations without manifesting for a long time but it can be located in one of the gene loci. Now scientists are actively studying genetic loci associated with the preference of the left hand.

A lot of research of left-handedness has been carried out lately and thanks to one of them it turned out that in the right-handed people only one right hemisphere activates during some action and in the left-handers both hemispheres are active. Thanks to this scientists were able to conclude that a right-handed brain works synchronously and it looks as if one part of the brain slows down the other. In left-handed people the hemispheres seem to activate each other and this allows left-handed people to think not only logically but also come up with unusual ideas and perceive creativity. That is why a large number of left-handers joined the ranks of famous people, musicians, artists, writers, scientists and investigators.

THE ROLE OF LATIN IN MEDICINE

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N. O. Symonenko – E.L. Adviser

Since ancient times, the Latin language has always been considered the language of educated people. It was used in all parts of the world. With time, this language began to «die» because English started supplanting it. Nowadays Latin is a dead language, but thanks to this fact Latin is used in scientific terminology. It is also considered to be the international language of all physicians in the world. The fact is that not every doctor knows English, but all the doctors know the medical terminology and the names of diseases in Latin. It is estimated that about 95% of English medical terms have Latin or Greek origin. This unique language can be compared to a dying tree. One can think that this

tree should be already cut down, but it is so rooted in the ground that it is no longer possible.

A famous Ukrainian poet Shevchenko said: «Well, it seems the words, words and voice nothing more, but the heart beats and revives when it hears them». And a medical student revives when he or she hears a familiar Latin word or phrase, because sometimes it is easier for a student to hear a term in Latin than several times in Ukrainian or English. The first thing we encounter at the medical institute is knowledge of Latin. We start using it from the first lesson in Human Anatomy, Histology, Medical Biology and other subjects. Latin is incredibly beautiful and quite melodic, but in its turn rather complicated.

Latin is the most important language in medicine. By the way, all medicines and diagnoses were derived from Latin or Greek. By learning to recognize different components you can understand the meanings of the new words in clinical terminology. For prescribing medicaments a future physician should master a special structure of a Latin prescription because the international pharmacological nomenclature has generally been based on the Latin language. That's why all prescriptions are written in Latin and any spelling mistake can cost a person's life. That is why every medical student requires a good knowledge of Latin.

THERAPEUTIC CLONING

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The review is devoted to the current biomedical direction in cell-replacement therapy - therapeutic cloning, which is the most universal approach for obtaining patient-specific embryonic stem cell lines (hESC) with tremendous potential in maintaining and restoring human health.

Now the main sources of stem cells directly for biomedical work are stem cells from umbilical cord blood and adult stem

cells. Both sources have serious limitations: umbilical cord blood stem cells are autogenous only to the newly born, and receiving stem cells from the patient himself is unsafe for him. In addition, in general opinion, the potential for differentiation in these cells is lower than in ESCs. Obviously, the most versatile and reliable source of human stem cell (SC) production is through cloning technology.

To date, fundamental scientific and technological aspects do not create barriers to therapeutic cloning. And although there are already about 500 human ESC lines in the world, none of them have been obtained by cloning technology — by nuclear transplantation. Two sensational publications in the journal *Science* for 2004 and 2005 of South Korean scientists on receiving individual ESC lines for 11 seriously ill patients turned out to be unreliable. There is a report about obtaining a patient-specific line from activated parthenogenetic human oocytes containing histocompatible stem cells for an oocyte donor, a potential patient in whose treatment it is already possible to use autogenic cells without an immune rejection reaction. Another achievement is the production of cloned human embryos with fibroblast nuclei that developed to the blastocyst stage, but the ESC lines were not created.

At the same time, an intensive search is underway in the world for alternative possibilities for obtaining patient-specific ESC lines for biomedical purposes. The most promising alternative approach for creating patient-specific lines from somatic cells for biomedical purposes is to obtain KSK-like cells or induced pluripotent SC CiPSD lines. This is a new area of research in cell replacement therapy, initiated by the work of Japanese scientists in 2006 on mice to reprogram fibroblasts to a status similar to pluripotent. The possibility of such a transformation for human fibroblasts was soon shown. Genetic modification of fibroblasts was performed by retroviral transfection of four key pluripotency factors: Oct3 / 4, Sox2, Klf4, c-Myc, and subsequent expression of these genes induced

reprogramming of somatic cells with a return to pluripotent state. Although the effectiveness of this approach was very low, and it is also known that the use of viral vectors can lead to malignancy of iPS cells, these works became a sensation. A whole series of studies with induction factors followed, and an active search was undertaken for other ways of introducing genes into somatic cells (without resorting to retroviruses) with minimizing the modification of the genome. As a result, the possibility of a safe method of reprogramming cells using transposons and only one Klf4 factor was shown in mice.

However, it is too early to consider iPS cells to be an adequate alternative replacement for ESCs for regenerative therapy. For biomedical purposes, it is necessary to reprogram your own cell genes instead of adding new copies, and only therapeutic cloning technologies provide a unique opportunity for such reprogramming of somatic cell nuclei. The reversibility of the gene expression program under the influence of the oocyte cytoplasm, a return to the pattern of embryonic expression in somatic donor nuclei allows us to consider reconstructed human embryos as the main source for obtaining patient-specific ESC lines.

The unique value of ESCs for medicinal purposes determines a serious need for the development of therapeutic cloning in our country. It is possible to accomplish the tasks of therapeutic cloning on the basis of reproduction centers, which, in addition to their direct purpose, can become centers for obtaining ESC lines, primarily for women patients of this center and any members of their families. It can be expected that with the development of therapeutic technologies, obtaining one's own ESCs will become available to everyone. It is necessary to carry out close cooperation of reproduction centers with relevant research laboratories focused on solving fundamental problems and developing new technologies.

ANALYSIS OF QUARANTINE EFFECTIVENESS IN UKRAINE

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Now one of the most pressing topics in the world is the disease caused by the coronavirus SARS-CoV-2. The outbreak began in December 2019 in Wuhan, Hubei Province, China, but on March 11, 2020, WHO called the infection a pandemic. Now all people on the planet live in quarantine.

On March 12, 2020, quarantine measures were introduced in Ukraine. We suggest looking at whether they produce results.

SARS-CoV-2 (Severe acute respiratory syndrome coronavirus 2) is a single-stranded RNA-containing strain of the SARS-CoV. So, it is one of the representatives of a large family of coronaviruses. There are many versions about its origin, but it is known for the first time that it has spread to the seafood market.

Probably not every citizen of Ukraine on March 12 said that there were very few cases in Ukraine, so it is not necessary to introduce quarantine, but if you look at the COVID-19 distribution statistics in the countries that are the epicenter of the disease, we can draw some conclusions.

We suggest comparing the virus spread statistics in Ukraine and Italy.

For the first time in Italy, the virus was detected on 31/01/2020, 21/01 (28 days after the first patient was detected) there were 20 cases, 27.02 (33 days after the first patient was detected) - 575 cases, 03.03 (38 days after the first patient was detected) - 2457, 06.03 (41 days after detection of the first patient) - 4591.

Now let's compare it with the epidemic in Ukraine. The disease was first discovered on 03/02/2020, 29/03 (28 days after the first patient was detected) - 518 patients, 03.04 (33 days after the first patient was detected) - 1167, 08.04 (38 days after the first

patient was detected) - 2036 patients, 11.04 (41 day after detection of the first patient) - 2777.

Consider that in Ukraine quarantine was introduced on the 11th day after the first patient was identified, with the number of patients - 7 people, while in Italy it was introduced on the 43rd day after the first patient was identified, with the number of patients - 1492 persons.

Analyzing these figures we can easily conclude that quarantine measures in Ukraine are really effective.

BIRTH TOURISM PHENOMENON

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O. R. Gladchenko – E L Adviser

Reading the «Esquire», I came across the news: «U.S. Government and Donald Trump personally intend to change visa rules for pregnant women from other countries». It's connected with a phenomenon, which received the name «birth tourism». The essence is very simple: pregnant women from foreign countries travel to the USA intentionally to have a baby there and then to register a foreign citizenship for their newborn child. So, why do people leave their country to give birth in other countries and why is it improper?

Let us analyze this phenomenon and illustrate it having Ukrainian women who fly to give birth in the USA as an example.

1. The first and the most important reason for birth tourism is that it provides American citizenship for a newborn child. The USA automatically provides American citizenship to any child, who was born in the territory of the country (the 14th amendment to the USA Constitution). But there are exceptions: citizenship won't be provided to children of diplomats and to children of illegal immigrants.
2. The existing stereotype about the USA as the ideal country. From the above mentioned it is possible to track the following logic of some women: «There are better living standards in the

US so I will fly there to have a baby because I want my child to have a good future». But it's wrong because the USA does not occupy 1st place in ratings comparing the countries in the world for happy life and only occasionally it takes place in the top-10.

3. Pregnant women who don't plan to come back home after delivery choose a USA city randomly but not logically. Most often women fly to give birth to New York, Los Angeles and Miami. It is interesting to know that neither of these cities is even in the top-30 among American cities with high living standards (according to 2019 data).
4. Giving birth in the USA is expensive and unprofitable. According to «Associated Press», Ukrainian women pay from \$18,000 to \$60,000 for childbirth. It all depends on the choice of hospital and the package of services available. Thanks to the birth tourism a whole industry of intermediary birth tourism agencies appeared in USA. These agencies help foreign pregnant women to fill in documents, to find doctors, residence and flights. For example a VIP-package for the rich still includes a rented car and an apartment on the so called first line. But American maternity hospitals are intended for easy childbirth. As a rule women treat hard cases in the clinic or they apply there if they wish the highest quality of service that is why it is extremely expensive.
5. Giving birth in the USA is a fashionable trend especially for Ukrainian celebrities. They refuse to have a baby in Kyiv and prefer New York or Miami instead. A foreign name for their newborn child can also be attributed to that reason.
6. A newborn baby is often used to get a Green card. When a child gets older and reaches 21 years old, his parents can fill in the application form for family reunion and in case of positive result they can quietly plan to move to the USA with all their relatives including the elderly who will be able to receive a pension in US dollars thanks to the American legislation. The

Green card owners are also allowed to work, to own real estate, to take loans at local banks etc.

7. American citizenship for other relatives. After 5 years possession of the green card relatives can apply to obtain a USA citizenship, which gives a chance of visa-free entrance in 150 countries of the world, receive grants, high quality medical care and education.

With all this in mind we can conclude that giving birth in the USA and a desire to receive American citizenship and to provide a better future for a child are possible reasons for birth tourism in Ukraine. This phenomenon also illustrates poor quality medical care in our country. If you compare the photos of Zhytomyr maternity hospital wards with the same NY wards everything becomes obvious. But on the other hand birth tourism is very expensive and only this prevents it of becoming a common event in Ukraine. In America childbirth costs \$18,000 compared to \$180 in Ukraine.

This phenomenon is negative for Ukraine because we lose future citizens and it is unlikely that children with Ukrainian background born in the USA will study Ukrainian culture or aspire to help Ukraine. And only when Ukrainian government provides normal living standards for ordinary citizens properly the birth tourism phenomenon will disappear.

EPIDEMIOLOGICAL FEATURES OF LEUKEMIA IN CHILDREN

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The problem of childhood leukemia is being discussed in the papers of the researchers from all parts of the world. This pathology is almost 1/3 of all malignancies in children and ranks first among the diseases of blood. The most common type of acute leukemia in children is acute lymphoblastic leukemia accounting for 80% of all the cases. The incidence of leukemia ranges from

3.2 to 4.4 per 100 thousand children under the age of 15 years. Peak incidence occurs at age of 2-5 years. 50% of childhood cancer deaths occur because of leukemia.

Nowadays an extensive research work is being carried on to find out the epidemiology of leukemia for resolving funding measures for further implementation of the provision of highly specialized health care for children with cancer and hematological diseases.

The purpose of the study is to analyze the epidemiology of child leukemia population of Ukraine and Sumy region in 2010-2016.

Objectives of the study is to analyze the incidence, prevalence, mortality of leukemia among children in Ukraine during 2010-2016 and determine the number of cases of leukemia among children that have been under the supervision for five years; study the incidence, prevalence, mortality of leukemia among children population and the number of patients with leukemia that have been supervised for 5 or more years during 2010-2016 in Sumy region.

Research methods: epidemiological; analytical; statistical.

Database of research were officially published data of morbidity and mortality of patients with leukemia, presented at the National Cancer Register (National Cancer Registry of Ukraine).

Also, materials for research are the official sources of information on health in the state, namely the reference indicators of the health institutions of Sumy region for years 2010-2016 provided by the regional information-analytical center of medical statistics.

Child population: children aged 0 to 17 years.

Data analysis and results: The incidence of leukemia among children in Ukraine during 2010-2016 kept at the level 3,25-3,88 cases per 100 thousand of population. During 2014-2016 a decrease in incidence occurs, but rates are higher than in

2010-2011. During 2010-2016 we observed an increase in incidence of leukemia in children in Ukraine 11.9% from 68.2 to 76.3 per 100 thousand of population. Mortality of children from leukemia in Ukraine in 2011-2016 ranged from 4.2 to 9.6 per 100 thousand. In 2015 and 2016 we observed a slow decline of this indicator. The number of patients under the supervision for five or more years during 2011-2016 in Ukraine ranged from 44.8 (in 2012) to 45.5 (in 2016) per 100 thousand of population. In 2016 we observed the highest rate of corresponding patients for the last seven years.

The incidence of children with leukemia in Sumy region during 2010-2016 years ranged from 1.11 (in 2012) to 6.23 (in 2014) per 100 thousand of population. But practically all these years, except for 2012 and 2016, the incidence was higher for the same average for Ukraine. The decrease of incidence was observed in 2014-2016 years with this indicator in 2016 within the average value in Ukraine. The prevalence of childhood leukemia in Sumy region during 2010-2016 increased from 70.2 (in 2010) to 83.8 (in 2016) per 100 thousand of population. It was higher than the average indicator in Ukraine. In the 2014-2016 the incidence of leukemia in Sumy region was more than twice higher than the same average indicator in Ukraine.

In 2013-2016 the mortality from leukemia in Sumy region was lower compared with the average similar indicator in Ukraine, but it was higher in 2011 (21.3%) and in 2012 (2%). In 2013 mortality in the Sumy region was 2.8 times lower and in 2015 3.7 times lower than the average indicator in Ukraine. This fact may indicate indirectly the effectiveness of proper medical assistance to children with leukemia in Sumy region. In 2011-2012 and 2015-2016 the number of patients who were monitored for 5 or more years was lower than the average number in regions of Ukraine.

WHY IS WATER SO IMPORTANT FOR YOUR HEALTH?

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Nowadays a healthy lifestyle is very popular. Everyone should take care of his health because human well-being, good mood and even the longevity of our life depends on the state of our health.

As we all know a human body consists of 60-70% of water, 24-34% of organic matter and 6% of inorganic substances on the average.

Each of us consumes a large amount of liquid every day namely tea, coffee, milk, various juices, etc. but not pure water unfortunately. As a result our body becomes dehydrated and we feel worse and gain weight. There is a special formula which can help us to use enough water every day.

To find out how much water you have to drink per day, you need to multiply your weight by 35.

3 reasons why it is important to drink water

1) Weight loss

One of the most popular reasons why people start drinking water is their desire to lose weight. One of the main stages of weight loss is the replacement of sugary drinks, juices or alcohol with pure water. Drinking water you can suppress your appetite because most often people are thirsty but they mistakenly think that they are hungry. With the help of water you will be able to control the feeling of hunger. Everyone should have a habit of drinking a glass of cold water in 20-30 minutes before eating.

Why should we drink cold water? Because such water will not cause enlargement of the blood vessels of the stomach and thus will not activate digestion. The stomach will not enlarge and the feeling of fullness will come much sooner afterwards.

2) Healthy heart

Drinking a certain amount of water every day the norm of which is different for each person can reduce the risk of a heart attack. For many years US scientists have been explaining the cause of longevity and they have found that people who drink five or more glasses of water can reduce their risk of heart attack.

3) No headache

The headache that bothers us as we often think for no reason really is caused by dehydration of our body. Most often if you have a headache, the most possible reason for it is the lack of water.

I want to conclude that enough water in our organism is one of the main conditions to implement our desire to have a slim body, good mood and healthy internal organs.

HEALTHY ENVIRONMENT FOR OUR FUTURE

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"Environmental pollution" is a phrase with sounds almost everyday because this problem is very urgent now. It's the greatest trouble of people of all nations. Our planet must be saved. We must do something to prevent the pollution. But few people worry about our environment. Although the consequences of our indifference are terrible. The life of future generations depends on our decisions.

The sustainability discourse started in the 1970s, and the 1992 UN Conference on the Environment and Development recognized intergenerational equity as central for policymaking that safeguards the future. This principle is now found in the constitutions of many countries. But its implementation in the world policy-making, however, is rare. The World Commission on Environment and Development states, "We borrow environmental capital from future generations with no intention or prospect of repaying. We act as we do because we can get away

with it: future generations do not vote; they have no political or financial power; they cannot challenge our decisions.” [1]

World Health Organization (WHO) reports that 12.6 million people die each year due to environmental pollution. According to the WHO, there is a great impact of harmful environment on certain diseases and injuries. The WHO report "Environmental Disease Prevention - Assessing the Severity of Diseases Caused by the Environment" states that 24% of all diseases in the world originate and develop due to poor environmental conditions. And 33% of all cases are the children diseases[3].

The main sources of environmental pollution are:

- Industry (Environment, Processing)
- Transport (for example, motor transport in the city is a source of about 60-70% of air pollution);
- Agriculture (agrochemicals, fertilizers, various means for combating plant diseases, pests, weeds)
- Household (solid and liquid household waste, combustion products resulting from the operation of heating systems).

Many people think that one plastic bag or plastic cup will change nothing, that only factories and transportation pollute the environment. Partly it is true, metallurgy has a significant impact on the environment. But if each of us does not throw away non-recyclable waste products every week and takes care of nature by greening it, then our environment will be improved significantly.

Therefore, necessary steps for our ecology are:

- increasing the number of appropriate garbage cans and timely removal of garbage;
- sorting the garbage;
- garbage should be placed where it will cause the least harm to people and nature;
- do not incinerate waste;
- carrying out environmental safety activities;

- participation in carrying out sanitary and anti-epidemic measures;
- promote healthy lifestyles, plant trees, flowers, maintain cleanliness near houses, along river banks, ponds, and in parks (so-called health days can be held).[2]

Only working together we will achieve the best results and healthy environment for future generations! Take care of nature, and it will take care of you!

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EFFECT OF STRESS ON THE OCCURRENCE OF CARDIOVASCULAR DISEASE

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Every day the modern person is exposed to stressful situations. In transport, at work, coming out of the entrance or even in our own apartment, we constantly feel stress, no matter what the profession of a person in which social and living conditions she lives, the stress accompanies her at every step.

The most stressful thing is affecting the cardiovascular system, the kidneys and the digestive system.

According to WHO, which was announced in the Verkhovna Rada during a roundtable on "Defeating death: key

factors affecting the life expectancy of Ukrainians", cardiovascular disease is the main cause of death in recent years - 67.0%, which means that cardiovascular disease is one of the major medical and social problems of Ukraine today.

The main diseases that cause mortality from cardiovascular pathology are: stroke, sudden death syndrome, heart attacks and cardiomyopathies, their predecessors are angina, arterial hypertension, arrhythmias, etc. Also, according to the Ministry of Health, nearly 100,000 strokes and over 40,000 heart attacks are reported annually in Ukraine.

Statistics are shocking, and doctors keep saying that stress, hypodynamia and poor nutrition are the causes of cardiovascular disease. And now it is worth noting that hypodynamia and poor nutrition can be eliminated independently by changing the way of life, but it is difficult to influence the stresses in the modern world.

Stress is the functional state of an organism that has arisen as a result of an external negative effect on its mental functions, nervous processes or the activity of peripheral organs.

After conducting the study, it was confirmed that medical students are often stressed, and unfortunately, 35% of students believe they have heart problems.

MODERN ACHIEVEMENTS OF GENETIC ENGINEERING AND BIOTECHNOLOGIES

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Modern medical science and the needs of practical health care require the use of scientific technology in basic research. The European federation of Biotechnology defines modern biotechnology as the use of sciences related to nature (biology, chemistry, physics) and engineering (e.g. electronics) in relation with biosystems in the bio-industry.

There are a few directions of biotechnological products :

- a cultivation of cells and tissues of animals (interferon, insulin, monoclonal antibodies, growth hormones, viral vaccines);
- a cultivation of cells and tissues of animals (alkaloids, hydroxy-cinnamic acids, polysaccharides);
- a production of preparations on the basis of microbiological synthesis (vitamins, antibiotics, enzymes). [2]

In highly developed countries biotechnology is considered to one of main directions of the development of the society. A medical biotechnology is the creation of medicines, bioregulators and vaccines, gene diagnostics and therapy, tissue engineering based on barrel cells. The world market of pharmaceutical products produces using biotechnological methods accounts for more than 60% of the total biotechnological market.

The genic engineering is the instrument of biotechnology. The task is to obtain certain genes that determine a particular feature of a cell or an organism. This task is solved by the chemical synthesis of gene by combination of nucleotides of DNA in a certain sequence; by the enzymatic synthesis of DNA on the matrices of informative PHA by means of reverse transcriptase; by fragmentation of total DNA of cage and further choice of fragments; by a receipt or creation of vector molecules - molecules of DNA, able to join the fragments of molecules of DNA of any origin, get to the cells and propagate in their autonomous or integrated state. Such vector molecules are created from bacteriophages and plasmids.[1]

The examples of the application of the genetic engineering are the creation of bacteria and fungi, which product hormones, antibiotics, vitamins, enzymes and other substances for the necessities of pharmaceutical and food industry; creation of transgene animals as living factories for the production of biomedical preparations, and also new breeds of experimental mice (knock-outs) for scientific researches of functioning of certain genes.[2]

The major achievement of the genic engineering is the creation of products of biologically active proteins (to insulin, interferon, growth hormone and others like that), and also the development of methods of activation of chains of metabolism associated with the formation of low-molecular BASS. [1] The genic engineering develops the methods of receipt especially of albumin vaccines against the viruses of hepatitis, flu, herpes, foot-and-mouth disease. The idea of using a combined smallpox virus for vaccination has been implemented. Genes encoding the synthesis of proteins from other viruses (e.g. hepatitis or influenza viruses) have been incorporated into the genome. As a result of vaccination an organism develops immunity not only against a pox but also against hepatitis, flu or other diseases caused by the virus.

One of main achievements of modern biotechnology is the production of recombinant, or genic-engineering therapeutic proteins of man in industrial scales. Currently, it is produced in different countries more than 120, of which 100, having passed clinical trials, have settled for use in the European Union and the United States.[2]

The development and production of innovative biotechnological medicinal facilities, of forming of research centers and clusters from the development of such preparations in Ukraine that are necessary and timely.

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MODERN LOOK AT ATHEROSCLEROSIS

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It is known that Atherosclerosis is one of the major cause of mortality in our time, but despite this, the exact therapy and pathogenesis have not been developed.

This pathology is caused by local changes of the vascular wall and general disorders of lipid metabolism that cause lipoidosis of the inner lining of the arteries.

With slow stenosis of the arteries, there is a gradual replacement of the functional tissue to the connective tissue, which leads to myocardial infarction, ischemic stroke or hypertrophy.

Science doesn't know how to stay and always move from one point to another, so recent studies by Kiss-Toth and Johnston show that the TRIB1 protein (Tribbles pseudokinase 1), which is present in macrophages, increases the number of receptors for LDL, which promotes the development of the disease. Also other researchers have found a correlation between atherosclerosis and thyroxine levels in the blood, suggesting that measuring thyroid hormones may help identify patients at risk of atherosclerosis.

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INFLUENCE OF Ag NANOPARTICLES ON THE ANTIMICROBIAL ACTIVITY OF DENTAL COMPOSITES AGAINST *E. FAECALIS*

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The results of treatment of odontological diseases are not always successful: 82% in the world, while in Ukraine only 50%. *Enterococcus faecalis* is the most common pathogen causing complications in dental procedures. This is due to its resistance to antibiotics and ability to form biofilms. The topical issue is finding alternative antimicrobials. Ag nanoparticles (Ag NPs) have shown high efficacy against many polyresistant strains.

Objective: To evaluate the antibacterial effect of Ag NPs on the clinical strain of *E. faecalis*.

Materials and Methods: Ag NPs with a concentration of 3000 g / L were used for the study. Clinical strain was obtained in the microbiological laboratory of Sumy State University. Antimicrobial activity of the Ag NPs against *E. faecalis* was evaluated using the serial dilution method and the minimum inhibitory concentration (MIC) was determined. Determination of the minimum bactericidal concentration (MBC) was carried out by direct seeding of the microorganism from liquid media into dense nutrients. The time killing clinical strain was evaluated by the number of bacteria at appropriate intervals. The impact of Ag NPs on biofilm was evaluated by determining the volume of biofilm formed by gentian violet staining.

Results: As a result of the MIC study the MBC, respectively, was 2.5 µg / ml. From 1 hour of exposure, the dynamics of dieback of the strain increased with each interval of time. Ag NPs inhibit the formation of biofilm in the early stages. The number of cells on 3-day biofilm decreased by 2-3 times, which indicates the high efficiency of Ag NPs.

Conclusion: The use of Ag NPs in dental practice is a promising trend because of its inhibitory effect on the formation and activity of bacterial films. The results obtained may serve as a basis for further development of commercial antiseptic agents.

STREPTOSOTZIN DIABETES MODEL

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Diabetes mellitus (DM) is a widespread disease leading to the development of serious complications, disability and premature death. A mandatory factor in the pathogenesis of type 1 diabetes is absolute insulin deficiency, leading to characteristic metabolic disorders. The fundamental treatment of Type 1 diabetes costs a lot of millions dollars every year for the past 100 years. Medicine spends a huge amount of money for daily insulin injections. Insulin therapy prevents death of patients from hyperglycemic coma, but doesn't prevent the development of severe chronic complications. That is why, the search of more effective and preferably cardinal ways for antidiabetic treatment is extremely important. Great attention is paid to experiments on animals with experimental diabetes.

The first model of diabetes was obtained in 1889 (Mering, Minkowski) as a result of removal of the pancreas in a dog. Later it was found that experimental diabetes can be obtained not only by pancreatectomy, but also after the introduction of various chemicals that destroy the insulin-producing β -cells of the pancreatic islets. Alloxan, streptozotocin (STC), dehydroascorbic acid or dithizone can be used. Each of which selectively causes β -cell necrosis, preserving (unlike pancreatic ectomy) exocrine pancreatic function. Streptozotocin model of diabetes is the most popular. STC was first described in late 1950s as a promising antibiotic with antitumor activity, but it was used mainly as a diabetic drug due to its toxic side effect on pancreatic β -cells. In structure, it resembles sugar molecules, and this is enough to be captured and absorbed by cells using the glucose transporter GLUT2. The range of diabetic doses of STC is quite wide, ranging from 40 to 90 mg per 1 kg of body weight. A frequently used single intravenous dose in adult rats to induce IDDM of insulin-dependent diabetes is from 40 up to 60 mg / kg, but higher doses are also used. An intraperitoneal administration of a similar or higher dose is also effective, but a single dose below 40 mg / kg body weight may be ineffective.

CREATING A QUESTIONNAIRE OF LYME DISEASE

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Relevance. Currently there is a tendency for increasing Lyme disease in Sumy region. The increase of the indicator by 1.7 times indicates that the epidemiological situation in Ukraine and Sumy region remains difficult. The increase in the incidence of the disease indicates the widespread of Lyme disease in Sumy region.

The aim of the study. Creating a questionnaire to help raise awareness of Lyme disease, prevention and consequences.

Materials and methods. Patients who have been attacked by ticks and have sought medical help at Sumy Regional Infectious Diseases Clinic conduct an anonymous survey, with the voluntary consent, according to the created questionnaire.

Research results. The unified anonymous questionnaire "Questionnaire of the patient with the Lyme disease "contains 16 questions with answer options and the ability to make your own comments. The first group of questions relates to gender, age and social data of the person. The second group of questions addresses the epidemiological features of this pathology. The third group shows methods of tick removal, prevention measures for prevention of suction, awareness of antibiotic prophylaxis. The fourth group is the clinical features of the disease.

Conclusion. According to the anonymous questionnaire an action plan will be developed to prevent the disease, in accordance with designated areas of Sumy region for the risk of infection.

DEPENDANCE OF SALIVART GLANDS TUMOR MORBIDITY ON HARMFUL EMISSIONS OF SUMY AND CHERNIHIV REGIONS ENTERPRISES

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Introduction. Salivary gland tumors account up to 5% of all maxillofacial tumors. The risk factors for tumors include smoking, ionizing radiation, the impact of viral agents (Epstein-Barr virus), harmful working conditions on nickel and rubber production, and also the possible impact of alimentary factors and genetic mutations is under consideration. Studies from different regions of the world showed differences in the frequency of tumor types, age and gender structure which points out that salivary gland tumors have regional variations.

The purpose of study is to analyze the morbidity on salivary gland tumors in the northern regions of Ukraine (Sumy and Chernihiv regions) and to compare the obtained data with the environmental situation.

Object and research methods. Data from the National Cancer Registry of Ukraine for the period from 2005 to 2016 was used in the study. Information on the concentration of pollutants in the atmosphere was obtained from ecological passports of Sumy region for 2005-2016 and Chernihiv region for 2008-2016.

Conclusion. There are five ecologically dangerous sites in Sumy region which emit a large amount of pollutants into the atmosphere, and four of them are located in Chernihiv region. The morbidity rate on salivary gland tumors in Sumy and Chernihiv regions is increasing from year to year with higher morbidity rate among the male population. When studying the morbidity level and the ecological situation in these regions no strong dependence was found between the morbidity rate and harmful emissions into the atmosphere.

ELECTRIC STIMULATOR FOR MEMORY IMPROVEMENT

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Today, almost everyone complains about memory problems. Old age is often accompanied by memory impairment. Unfortunately, this problem is also a compulsory companion of diseases such as epilepsy, Parkinson's or Alzheimer's. Moreover, even people at a young age may notice forgetfulness in everyday life.

The reason for memory impairment lies in the deterioration of brain activity, the deterioration of the excitability of nerve cells, the violation of the connections between neurons. Unfortunately, in most cases this process is irreversible, but modern science and medicine continue to struggle and make notable successes in improving memory in people who are faced with the problem of memory loss.

The research, published in the journal *Nature Neuroscience*, found that age-related decline in working memory can be reversed by stimulating two key brain areas at a specific rhythm.

A team of scientists at Boston University has demonstrated technology that can restore the memory of 70-year-olds to the age of 20 and improve their learning ability. It's about stimulating the brain with electricity, but without connecting the electrodes directly to the gray matter.

Usually, researchers use the method of "deep" electrical stimulation, fixing conductors in certain areas of the brain. It is effective but impractical because the procedure is quite complicated.

An alternative is indirect stimulation through electrodes placed on the scalp. This is the method used by Rob Reinhart, a neuroscientist at Boston University, to improve the memory of the elderly, which usually diminishes with age.

The findings are early and only relate to healthy volunteers at this stage, but could point to new ways to boost brain function in people with age-related cognitive decline such as dementia and Alzheimer's patients.

Using a technique known as electroencephalography (EEG) to monitor brain activity and an another called transcranial alternating-current stimulation (tACS), the scientists stimulated the brains of a group of young and old people and were able to modulate the brainwave interactions linked to their working memory. The study involved 42 younger adults aged 20 to 29 and 42 older adults aged 60 to 76, who were all assessed for their performance in a working-memory task.

Working memory refers to information retained temporarily for use in immediate tasks such as reasoning and making decisions.

Without brain stimulation, the older people were slower and less accurate than the younger ones. This was because the younger ones had higher levels of interaction and synchronisation of certain brain wave rhythms, the researchers said - suggesting that targeting these types of rhythms in the older people's brains might help their function.

While receiving active brain stimulation, older adults improved their working-memory test scores to the levels of the younger people. The effect lasted for at least 50 minutes after the stimulation was given, said Robert Reinhart, a researcher at Boston University in the United States who co-led the study. "By using this type of stimulation (we found) we can reconnect or resynchronise those circuits," he told reporters in a telephone briefing.

Reinhart said that the findings opened up new avenues for research but had no immediate implications for use in medicine: "Much more basic science has to be done first." Neuroscientists agreed that the findings raised interesting questions about how working memory functions, and how it declines with age, but that it would need more research before being developed for clinical use.

So, old people, as well as people suffering from diseases such as epilepsy, Parkinson's or Alzheimer's, look forward to research results published in the journal Nature Neuroscience.

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MEDICAL APPLICATIONS FOR 3D PRINTING

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3D printing is the production of an object based on various three-dimensional models located on a digital medium. The printing process is based on the principle of laying a large number of thin layers one after the other.

3D printing can be of different types, both laser or inkjet, and extrusion. Most common are inkjet printers. This method is non-contact and can use thermal, piezoelectric or electromagnetic technology to apply very small drops of living cells and various biomaterials to a special surface, conforming to all digital instructions for the production of soft tissues or individual human organs. 3d devices from the company “TIJ” are more common and convenient for high-quality medical printing. Due to their high digital accuracy, convenient control, versatility and positive impact on mammalian cells, these devices are already used for printing ordinary 2D / 3D tissues and various organs (this type of printing is called bioprinting).

With TIJ devices, you can perform other complex tasks, such as introducing medications and gene transfection during tissue printing. Tissue or organ failure, which is caused by a person getting old, suffering from a disease, having birth defects, or having an accident, is a very common problem. Today, to cure organ failure, doctors resort to organ transplants from other people (donors). The process of organ transplantation and further patient monitoring is very expensive. Therefore, 3D printing is a cheaper, but no less effective substitute for conventional transplantation.

Today, 3D printing is used more and more often , becoming a very useful tool in medicine and it can make a *scientific breakthrough* in near future.

The medical advances that have been made using 3D printing are already significant and exciting, but some of the more revolutionary applications, such as organ printing, will need time to evolve.

SECTION 4 SOCIAL, PEDAGOGICAL AND LINGUISTIC SCIENCES

MASS PANIC AND TECHNOLOGY

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Mass panic is an emotional condition of mass, which characterized by a feeling of uncontrollable fear of a certain danger, which spreads in the process of mass «infection» with a loss of self-control.

We can consider mechanisms, causes and consequences of mass panic on the example of October 30, 1938. On that day, a radio play based on H. Wells' book “The War of the Worlds”, caused a huge panic among the population of the entire state of New Jersey. Millions of people from different cities fled their homes with fear as they believed that the Martian troops had actually landed on Earth and wanted to capture it.

The main reason for this reaction is, first and foremost, the very low level of information about this "incident" and the excessively realistic nature, as the show started without warning and interrupted the programs that were already underway. People did not have a clear idea of what was going on, so they simply ran away from their homes to escape a threat they knew nothing about. In this case, the main mechanisms of mass panic were the unexpectedness and lack of information in a dangerous (in the understanding of the people) situation, as well as the mass contamination of fear and anxiety emotions.

The consequences of this disorder were great material damage and moral (and sometimes physical) harm to the population. In addition, this situation caused a riot in the cities: the main institutions could not work, traffic could not move through the country.

Basing on this historical example, we must remember that modern technology can not only help humanity, but also can cause

mass disorder and damage of all kinds. Therefore, it is important to use technology in a beneficial and reasonable way.

MOST EFFECTIVE ADVERTISING FORMS

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T.V Pochatko, English language adviser

The intensive development of advertising communication is a powerful tool for the sale of goods and services, as well as a means of active economic and technological improvement, the development of Internet sites and determines the face of the modern Internet [1].

Unlike traditional advertising online advertising is still developing but has several advantages:

- It responds quickly to consumer needs. Information on the site can be changed several times a day, while traditional ads must be prepared at least for a week;
- It covers a large audience;
- We see it involuntarily, like a TV commercial;
- It is less expensive in comparison to TV advertising;
- The simplicity in evaluating its effect with the help of special services.

It is the opportunity to be in constant contact with consumer and track statistics does online advertising the most effective tool. As the Internet user sees and hears around a variety of offers, and more often searches and forms specific queries, so *search engine optimization(SEO)* becomes the most important.

According to statistics, search engine optimization has the highest percentage of reach and conversion rate. A simple scheme looks like this: a consumer search query is the content of the site corresponding to that query, and the presence of a top issue - a visit to the site by a consumer - is a purchase.

Contextual advertising also appears in response to a search engine a top query above the top Google issue list. It is Google partner sites already with a graphic image, without some search

engine optimization, but with some additional settings, and its task is to "entice" the client. This type of advertising is quite effective and allows you to quickly appear in the top issue. At the same time, search engine optimization needs more elaboration. Such campaign profitability is easily measured by cost per click.

Display advertising is not as informative as those mentioned above, but also effective enough. They are mostly graphic images, banners with a minimum of text, but are more emotional. They work on the image and brand recognition, contain information about the company name, sitelinks make people buy, read, participate, take advantage of the promotion and so on. The effect of such advert depends on the number of its demonstrations. But even with low conversions, it reminds itself of the brand. And an interesting image campaign will eventually lead to a buyer.

Viral marketing is the most creative type of advertising that encourages the transmission of viral video, picture, text from user to user of the Internet. One of the advantage of this type of advertising is the low cost: you pay only for the production of advertising. It is a unique exciting idea or benefit that would motivate consumers to share what they find. It is often applied to a new, unknown product or service [2].

Social marketing is the search for potential customers on the social networks, forums and blogs. It usually delivers high conversions by reaching a very broad and targeted audience, forming thematic groups. It is effective enough in attracting new people and maintaining positive attitude to the company and the product by regular members of the group, forum, blog [3].

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HOW VARIABILITY OF LEARNING ACTIVITIES ENHANCES STUDENTS' COGNITIVE INDEPENDENCE

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Providing the variability of learning activities activates students' reflection mechanisms thus forming their cognitive independence. The organization of the learning process according to the individual educational path facilitates the variability of learning activities.

Development of individual educational paths based on the use of modern information technologies ensures the variability of the tasks for independent learning activities. The idea of individualizing the educational process is based on the idea of "navigating" the movement in the educational space. All this can be realized through providing the choice and creation of conditions for the implementation of students' individual educational paths. The development of these paths involves and requires taking into account the individual characteristics of the subjects of the educational process, their requests, opportunities, background, and interests. The subjects of the educational process should be regarded as the ones who have individual experience.

Individual experience causes individual preferences and tendencies to choose different, i.e. variable learning activities. This leads to individual learning thus stimulating independent learning.

To sum up, variability of learning activities through the use of modern information communication technologies, introduction of individual educational paths helps to provide individualization, therefore, enhancing students' learning and cognitive independence.

THE TRUTH IS WORTH IT

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Today we can find a lot of information everywhere. We are overloaded by it. There are a lot of facts we can find, but how we decide that it's truth? Some information is forbidden for us. Fortunately, there are journalists who want to know the truth. While we are taking care about ourselves, many things happen all around the world. We don't often think about global problems and the destiny of other people. But there are a lot of issues that should be solved and plenty of people need someone's help. We don't know how the world can be changed, so we should support each other as often as we can and be united. The truthful information can prevent a lot of cruel occasions. All in all, everyone should have a right to know the truth, which will connect the whole world to solve their problems together. But what is the value of truth?

While journalists around the world increasingly face threats of violence, imprisonment and even state-sanctioned murder, no campaign better advocated for the free press than Droga5's "The Truth Is Worth It" for The New York Times (NYT). Each spot tells the complicated origin story behind a real NYT investigation, culminating in the reveal of the final headline. With real audio and images collected during the news gathering process, the ads craft nail-biting narratives with all the drama of a Hollywood feature, somehow compressed into the length of an ad. While it might not come to mind first for the audience when they think back to the ads of 2019, the campaign has had a powerful and lasting impact on the creative world, illustrated by its awards throughout the year. [1]

While the truth is being twisted, bent and sometimes forgotten, NYT brings the truth back to readers across the world. This led to the development of the "The Truth Is Worth It," a campaign that brings light the danger, bravery, perseverance and

determination of a NYT journalist and ultimately how that helps people better understand the world. [2]

The truth takes fearlessness. Due to these ads we can be sure about the importance of public service announcements, which are aimed at achieving socially useful goals. These ads draw our attention to dominant questions, that are not discussed by other media. But the truth couldn't report itself, so NYT and Droga5 decided to show for world the real picture of what is going on nowadays. Their work was highly appreciated by the society and opened everyone's eyes to the essential problems. NYT has huge possibilities to know information, so they want to share it with big amount of readers to change this world for better. Truth is a powerful thing, so anyone can use it for the best. Despite of many secrets and dangerous occasions during the investigations journalists go on and do their jobs with a big risk for themselves, but with big benefit for the entire world. That is how a real journalism looks like.

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WHY IS IT IMPORTANT TO CHOOSE THE RIGHT PROFESSION?

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There are not many situations in each person's life when one has to make a global choice that affects the whole future. One of them young people have to do at school. It is a choice of future profession. And it is necessary to treat this choice as the beginning of a new interesting life stage, not as a necessity. A person who chooses his professional life path needs to understand the huge variety of modern professions, understand their content and really

evaluate their capabilities, abilities, interests. An incorrectly chosen profession in youth creates problems both for the individual and the society as a whole. The field of professional activity can be changed. However, such a step is difficult. A change of profession is usually associated with painful experiences, doubts, a waste of time and effort. But if the initial choice was made correctly, then the person learns and works with pleasure, noticing neither time nor fatigue, and then the professional success of the person is guaranteed.

This is not surprising. After all, we spend most of our lives at work. She can be pleasant and not very fond, fatigued, hateful and profitable. That is why work is one of the most important aspects of human life.

Depending on how a person relates to their profession, whether they love it or hate it, it depends not only on their mental health but also their career growth. In other words, success. The profession chosen by the person must first of all give pleasure to himself and be useful to others. A beloved, dreamy job is the key to a successful and happy life of any person without exception. The main thing is to do everything with confidence and know what you need in life. If a person persists in pursuing his dream, success will come to him.

There are so many different professions in the world. They are all very important and necessary. Each person chooses to take classes to their liking. Some try their hand at several professions, and over time, decide what they are interested in doing. Happy are those people whose nature and pursuits are in agreement. Doing things that you do not like means to doom yourself to be unhappy for at least eight hours every working day of your life.

There is no point in striving for success because it is not interesting, it is irritating, it is only a duty. Therefore, admiration for your profession is the first sign that you will be able to conquer new peaks, grow as a specialist, become an indispensable professional.

Enthusiasm for work can be a real boost to career growth. Most executives value a positive attitude and try to encourage the diligent and initiative in some way. A true specialist is valued first and foremost for his knowledge of his profession. Modern technologies are evolving at an incredible speed, so the knowledge acquired during higher or secondary specialized education, unfortunately, will not be enough for productive and quality performance over the years. Therefore, many enterprises and institutions offer their employees a variety of training courses, trainings, seminars. You can do advanced training yourself, learn about interesting and useful activities through friends, colleagues, websites. You can pay attention to related knowledge. No specialist will interfere with the knowledge of English or another foreign language. It is important to focus on what matters most in your work and to achieve the best results.

In order to succeed, it is important not only to set a goal, but also to plan the stages of its achievement. It is impossible to get everything at once, but gradually to overcome step by step - not so difficult and at least realistically.

In order to succeed in the profession, you need to remind yourself. Many professional books read, dozens of seminars and trainings attended, knowledge of foreign languages and twenty years of experience will not help you become a successful professional if you know only your achievements. Do not be shy, tell your supervisor about a new certificate in English courses or be reminded of successful performances at seminars throughout the year. Of course, there is no need to praise yourself. However, to remind yourself of your professional level from time to time is simply necessary, and it is also worth remembering that you can choose any profession, but you must always remain a person. You can be anyone: teacher, doctor, singer, actor or programmer. All you have to do is remember moral values.

THE COMPARATIVE PHRASEOLOGICAL UNITS AND THEIR STYLISTIC CLASSIFICATION

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The main aim of the work is to select the comparative phraseological units and to give their classification. According to V.L. Arkhangel'sky phraseological microsystem is the traditional unity of the systematic relations between the components of the phraseological units and between the phraseological units themselves on the basis of their structural-semantic peculiarities. So, the phraseological microsystem consists of 2 mutually connected subsystems: a system of relations and a system of constructions. It has the systematic character.

Phraseological unit is a stable combination of words with partly or fully changed meaning. The body of a phraseological unit is a composite sentence. We came to a conclusion that a phraseological unit is a combination of words with a low combinatoric index, which is conditioned by peculiar systematic features of the components or by special character of relation to the combination of words to reality.

Comparative phraseological constitute a great part of English phraseologisms. They can be divided according to 2 principles:

1. On the basis of the emotional force;
2. On the basis of the sphere of usage.

Depending on the emotional force they produce phraseologisms can be grouped into:

1. positively, negatively, neutrally coloured
2. image-bearing and characterising
3. expressive-emotional
4. intensive-characterising

Depending on the sphere of usage they are classified into:

1. Colloquial and bookish;
2. Situational.

Here are some examples of English comparative phraseologisms of the above given classification: *to fight like a lion, as fair as a lily, as busy as a bee*; speaking about a clumsy, awkward man we can characterize him as *a hog on ice*. Image-bearing phraseologisms can contain negative estimation. *As changeable as the moon* means that the person often takes different view of things and can hardly be relied upon. *Behave like a dog* stresses an impudent, incorrect behaviour. Intensive-characterizing phrasal units help to intensify an emotional-expressive effect upon a reader: *as black as hell, as red as a cherry* (is not only red, but speaks about an unusually strong health), *packed like herrings, as thick as thieves, as tall as a maypole, as white as chalk*. Situational are comparative phraseological units which describe the behaviour of people in definite situations (in a condition of fear, terror, panic, merriment, etc.): *as scared as a rabbit, like an aspen leaf, to laugh like a hyena*.

So a comparative phraseological unit is a grammatically formed figure of language which is based on a comparison of two objects or phenomena. The division of comparative phraseological units is conventional. A comparative phraseological unit is an effective means of creating a vivid artistic image, with its help an author gives the psychological analysis of his personages, their actions, portrait characteristics thus portraying a person many-sided. It assists an author in revealing his subjective estimation relation towards the facts of reality.

A SIDELIGHT ON CONVERSATIONAL ENGLISH

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If we were to compare the spoken and the literary language we should be greatly impressed by the marked difference that distinguishes the one from the other. This renders a closer study of spoken English all the more important especially because no serious effort has been devoted to this essential aspect of linguistic training. Greater flexibility as regards syntax and grammar is pointed out as one of the distinctive features of spoken English. It can best of all be perceived in its syntactical pattern ever so different from that of the literary language. As W. J. Ball in "Conversational English" puts it: "In conversation a much looser word order than in the literary language is customary. Conversation makes its own rules and if from time to time, they run counter to those of written English they are none the less valid – but in their own territory." And elsewhere: "Conversational English is more broken up in texture and the strands of grammar are less closely knit than in written English." Thus, depended as they are on the basic facts of traditional grammar, conversational structures should be studied as a separate entity if we are to learn speaking in an easy, expressively dynamic manner. It is an urgent, but difficult task.

As to its stylistic characteristics, spoken English occupies a place peculiar to itself. Though the gap between spoken and written English is less pronounced in educated circles, the former retains many of its typical traits. Prominent among them is the extensive use of simile and metaphor. Conspicuous by their absence are well-set-up clauses and phrases. Cadences and rhythms of spoken English are the main factors responsible for the choice of the sentence pattern. On closer study, one can observe too many stereotyped expressions which normally occur in every day dialogue. It should be said that in conversation much depends on context. W. J. Ball is absolutely right: "The context of the spoken word is complex – much more complex than a literary

context. It includes not only the situation but also the mood, mental and physical attitude of the speaker. It is conditioned by the person spoken to and his possible reactions.” So the main quality of everyday speech is the exact correspondence its lexical, grammatical, stylistic and intonation media of expression to the content, task and conditions of communication.

FORMING STUDENTS’ COGNITIVE CREATIVE INDEPENDENCE IN HEURISTIC PROFESSIONALLY ORIENTED SITUATIONS

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Successful studying at institutions of higher education requires high level of students’ independence, critical thinking, as well as the usage of creative approaches to learning activities, which should be meaningful and engaging.

Involvement into different types of independent cognitive and creative activity (required, desirable, optional) should happen under the guidance, but without direct participation of the teacher in the classroom or during extracurricular activities [1]. The last ones are of great importance as a student becomes the initiator of the search for knowledge, acquires the ability to manage his/her own activities, independently states and defines a learning task; plans his/her own work, organises and controls it; corrects the planning, organization and manages to monitor this work in progress, thus ensuring the development of personal self-regulation that serves as the base component of the manifestation of cognitive and creative independence;

Heuristic modelling of the professionally-oriented situations and tasks that contain some problems close to professional activity and require different approaches to their solution [1]. A student needs to define his/her attitude to the

problem, establish its professional value, choose the optimum means and methods of its solution. It provides students with the opportunity to exchange views and observations, prove their own opinions, make independent decisions; contributes to the forming of professional responsibility, formation of creative and professional knowledge, skills and abilities. Such activities also develop students' socially-valuable professional skills and norms of behavior, which are based on professional ethics, development of high degree of regulation and self-regulation of behavior, emotional and volitional spheres, the need for professional self-improvement, which ensures the formation of cognitive and creative independence as personal and professional quality.

All in all, students' creative independence is formed in heuristic professional situations which are meaningful and engaging, and require high level of students' independence and creativity.

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LEADERSHIP IN MEDICINE

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Leadership is one of the important forms of personal development. Today's changes are leading to continuous improvement of educational services. Students are a special population group that can be judged by society as a whole. Youth is a reflection of all the processes that take place in the country, how society cares for development and what it does, and the corresponding result can be obtained. Youth development is influenced by: family, upbringing, school (or other educational

institutions), environment, environment, economic and social status of society. Negative changes in society also leave their mark on student youth. However, much depends on the individual. For example, people's perception of problems is completely different. For some, solving them can lead to frustration and frustration, while others make them stronger and more motivated.

In today's context, we believe that the issue of leadership plays an important role in the formation of personality. It should be noted that humanity is evolving and new challenges are emerging to address the needs of society for young people who are ready to improve, to work on new technologies and inventions. Of course, there is a special emphasis in every developed country on the training of a health professional.

We believe that a leader is a person who has the ability to organize a team, it means not only to distribute tasks, to act authoritatively and to demand perfection from employees. Of course, this is not about a leader, especially when referring to the medical process. It is important for medical professionals to take into account the specific nature of the work. Doctors are constantly working for the benefit of society, trying to improve their skills and knowledge using new techniques and technologies. However, the team should always have a personality that you can turn to for help, to hear an objective assessment, to advise on treatment methods. This should be an experienced personality, respected by the team.

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Наукове видання

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