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

МАТЕРІАЛИ

VIII МІЖВУЗІВСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ

КОНФЕРЕНЦІЇ

ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ

КАФЕДРИ ІНОЗЕМНИХ МОВ

“TO LIVE IN A SAFER WORLD”

(Суми, 28 березня 2014 року)

The eighth scientific practical student`s, postgraduate’s and teacher’s

LSNC conference

СЕКЦІЯ 1 МОВНА ПОЛІТИКА ТА МІЖКУЛЬТУРНА КОМУНІКАЦІЇ ЯК ФАКТОРИ СТАБІЛЬНОСТІ У СУЧАСНОМУ СВІТІ

INTERCULTURAL COMMUNICATION AND LANGUAGE POLICY AS ESSENTIAL STABILITY FACTORS IN MODERN WORLD

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S.V. Podolkova – EL Adviser

In the twenty-first century intercultural rapport is the guarantor of productive global communication. Nowadays communication in its meaning becomes the most significant connection between nations, thus we should construct intercultural communication. It promotes cooperation between all concerned parties in many areas. Under conditions of information openness of national borders language policy becomes an important strategic factor in achieving sustained social development, countering ethnic and inter-ethnic conflicts. The only thing that helps representatives of different faiths and different ethnic cultures establish friendly contacts is dialogue. It makes possible to overcome misunderstandings and find more points of contact, spread friendly and peaceful relations worldwide. Modern period is characterized by serious social changes, as communication plays a huge role in international relations, it is a factor of stability.

No culture can exist without continual transmission and enrichment through communication that aims to achieve this purpose. Therefore, every culture has its own language, with the help of which native speakers are able to communicate with each other. It is difficult to overestimate the meaning of language in the culture of any nation. Language is the culture foundation, since all knowledge, skills, material and mental values are stored in a language system. Language is a mirror of culture, it reflects the inner world of a man, his environment, the mentality of the whole nation. Language is a tool of culture that generates personality of a person who sees through the language traditions and particulars image of the world. Therefore every country should lead honest language policy.

Language is one of the most universal and diverse forms of human culture expression, and perhaps even the most essential one. Intercultural communication exists nowadays exactly for communication between representatives of different cultures. Intercultural communication takes place when individuals influenced by different cultural communities negotiate shared meanings in interaction. The notion of intercultural communication depends on the opinion what a person considers a culture, so the definition of culture is quite controversial. In fact, all interactions can be arrayed along some continuum of "interculturalness". Interactions are most highly intercultural when individuals' group identities are most salient in determining the values, prejudices, language, nonverbal behaviors and relational styles upon which those individuals draw. When individuals of different cultural backgrounds become more intimate, their interactions typically move along the continuum from more intercultural to more interpersonal, though intercultural elements may always play a role. For casual or business communication, sensitivity to intercultural factors is a key to success.

When people of different cultural backgrounds meet, all differences between them can potentially lead to misunderstanding. Thus a method of comprehending the problems that can arise in intercultural communication is to investigate the ways communication patterns can vary between different linguistic and cultural communities. The variety between different languages, which people learning several different languages become aware of, is the difference between the vocabulary of different languages in terms of words and phrases. In every culture, the words and phrases of everyday language mirror the needs, values and attitudes that have been common and strong and thus have been necessary to communicate about. Another important area in discovering differences that can be significant in intercultural communication is different types of standardized phrases and metaphors. Even grammatical aspects of language are very different.

Learning a second language is not simply mastering an object of academic study, but more appropriate focus on learning a means of communication. Communication in its deep conceptualization is never out of context − even if it might seem as fatigue

communication and as a culture is a part of context, communication is seldom culture-free. Thus, today it is increasingly recognized that language learning and learning about target cultures cannot be separated realistically.

An international language was adopted to simplify the task of intercultural communication. Presently, such language is English. Nowadays, it fulfills the same role that Latin had in the Middle Ages – it is a world language or "lingua franca", and as itself, it is the main medium in intercultural communication. The status of English is changing alongside with the changing world and becoming multicultural around us. It is also a new phenomenon that worldwide English is more common now in communication acts where neither of the partners is a native speaker. This has led to a significant change in language teaching: the objective is no longer to enable a student to attain like native competence but rather to make him able to communicate fluently, understand the other speaker and make himself being understood. Recognizing the role played by English in international communication, the educational systems of the different countries have started teaching it at an ever younger age. This is quite wise decision, because we should be united with one language. The role of English as a world language will not be endangered in the near future as its hegemony cannot be questioned in the fields dealt with although it will have to fulfill its role in a multilingual and multicultural environment.

In conclusion, one can say that language policy and intercultural communication are essential factors of stability in the contemporary world. Accordingly, it seems urgent that foreign language learners should become intercultural aware of both their own culture and, more importantly, that of others, otherwise, they will interpret the foreign language messages based on their own cultures, whose intended meanings might well be interpreted on different cultural grounds and frameworks. So culture having different meanings should be based on its specific framework and presented to the language learners in its own turn.

NEOLOGISMS

M. Y Tykhomirova, K. O Stryzhachenko –
Sumy State University, group IN – 21
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Each year more than 800 new words appear in the English language. Oxford Dictionary is the most authoritative publication which explores neologisms. Most neologisms appeared through social networks.

By 2013, the word “selfie” had become commonplace enough to be monitored for inclusion in the online version of the Oxford English Dictionary. In November 2013, the word “selfie” was announced as being the “word of the year”.

Defining the word, the linguists point out, “creativity” speakers who are apt to invent titles for the new social, political or technological phenomena.

Other contenders for the title word in 2013 according to Oxford dictionary were twerk (“tverk” - known in hip-hop culture with emphasis on erotic dance movements of the lower body), bitcoin (name of virtual currency), unlike (“razlaykat”, “stop expressing sympathy”), showrooming (“shouruminh” - the practice of visiting the store to examine the product before buying it at a lower price on the internet).

Last year, the grand prize of the annual award for the best Oxford Dictionary neologism was given to the word omnishambles (from Latin omni “all” and the English shambles – “a complete mess”), which indicates a difficult situation, the perspectives of all of which are very vague.

Researchers of “Oxford Dictionary” annually select English words that best characterize modern society. In 2009, a special popularity was obtained by the word “unfriend” that is, removed from the list of friends), and in 2008 - the expression “Credit Crunch” (“credit crisis”) appeared.

In conclusion we’d like to say that the English language is still evolving and it is one of the most demanded languages in the world.

АНГЛІЙСЬКА В УМОВАХ ГЛОБАЛІЗАЦІЇ

Козаченко О.Ю., група М-31
Мальована Н.В.

Починаючи від останніх десятиліть XX століття, народи планети та їхні культури зазнають впливу потужного світового процесу, який дістав назву глобалізації. Масштаби й багатоаспектність цього процесу засвідчують, що людство вступило в нову добу свого розвитку, який матиме характер планетарних змін. Глобалізація опиняється в центрі уваги не лише політиків та економістів, а й філософів, соціологів, культурологів, письменників, журналістів, репрезентантів різних громадських рухів. Наслідки й перспективи її дістають неоднозначну інтерпретацію, що відповідає докорінній суперечливості самого цього епохального явища.

Серед позитивних наслідків глобалізації слід, насамперед, зазначити розширення світового інформаційного простору, посилення процесів мовної і культурної взаємодії, забезпечення звичайній людині доступу до інформації та світових інтелектуальних надбань. Важливою передумовою комунікації є вибір мови, якою вона здійснюється. На роль засобів цієї комунікації, як правило, претендують кілька так званих світових мов, передусім англійська.

На хвилі глобалізації і розвитку сучасних технологій англійська підкорила світ так, як це не вдавалося жодній мові в історії людства. Фахівці стверджують, що до англомовного світу належить близько півтора мільярда осіб. Найбільша англомовна країна — Сполучені Штати Америки, це близько 20% англомовного населення планети. Англійська вже сьогодні є другою мовою для громадян Європейського Союзу з населенням майже 500 млн.

Мова стає засобом міжнародного спілкування, коли їїособлива роль визнається всіма країнами. Переформатування світового порядку після Першої, а потім і Другоїсвітовихвоєн мало своїм результатом створення нових міжнародних організацій та альянсів. Це спричинило безпрецедентну потребу

у світовій linguafranca. Linguafranca — ценазва для мови, яку використовують як засібділового та культурного спілкування людей, що розмовляють різними мовами. Чимало епох у людській історії характеризуються наявністю своєї linguafranca. Це і грецька та латина в Римськійімперії і Середньовіччі, іспанська в Іспанськійімперії і т.д. У XX столітті в цій ролі англійська поступово замінює французьку як мову міжнародної дипломатії. Вперше офіційний статус англійській був наданий Лігою націй. Її значення ще більше посилилося післяс творення у 1945 році ООН.

Якщо глобальна англійська почалася з домінування двох успішних імперій — Британської та Американської, то нині вона є мовою ще однієїі мперії, беззаперечне панування якої поширюється на всю земну кулю, — Інтернет. Чи зможете ви без англійської скористатися тією нтелектуальною силою, яку він надає? Очевидно, щоні. Дослідники доводять, що 80% інформації зберігається у світовій мережі саме цією мовою, а її обсяг подвоюється кожні 18 місяців.

Сьогодні англійська є мовою глобальної економіки та глобального бізнесового середовища. Для успішної кар'єри та професійногозростанняу великих компаніях просто необхідно вільне володіння англійською мовою. Навіть якщо міжнародна компанія знаходиться у Швеції або Франції, її співробітники спілкуються англійською (або сумішшю рідної з англійською). Практично така сама ситуація в науці. Більш ніж 90% наукових журналів, що мають авторитет у світі, друкуються англійською.

У глобалізованому світі англійська є мовою міжкультурних комунікацій, бо незалежно від того, ким ви є: українцем, італійцем, індійцем, росіянином чи німцем, зібравшись усі разом ви спілкуватиметеся англійською. В багатьох країнах, де існує міжетнічне напруження, саме англійська виконує роль етнічно нейтральної мови.

Якщо ще 50 років тому ніщо не свідчило про можливість появи світової linguafranca, то сьогодні очевидно, щоновий світовий лінгвістичний порядок уже визначає і надалі визначатиме глобальна англійська.

«NATIONAL GEOGRAPHIC»: UKRAINIAN EDITION

M.O. Dubinina – group JT-11
V.E. Pronyaeva

The National Geographic Society has been inspiring people to care about the planet since 1888. It is one of the largest nonprofit scientific and educational institutions in the world.

National Geographic, formerly the National Geographic Magazine, is an official magazine of the National Geographic Society. It has been published continuously since its first issue in 1888, nine months after the Society itself was founded. It primarily contained articles about geography, history, and world culture. The magazine is published monthly, and additional map supplements are also included with subscriptions. It is available in a traditional printed edition and through an interactive online edition. The current Editor-in-Chief of the National Geographic Magazine is Chris Johns.

The first version of Ukrainian «NG» was released in April 2013. It is still not easy to find it on sale. Editor-in-Chief is Olga Valchyshen. The magazine is designed for intelligent, thoughtful men and women.

This is a monthly magazine. Publication is writen by an international team that deals with scientific expeditions around the world. Ukrainian contains the selection of material from the archives of publications that may be of interest to Ukrainian readers. Ukrainian journalists propose articles and photo materials about our native country. The edition presented «Top 50 photos in the entire 125-year history of the National Geographic magazine» in Lviv and Kyiv.

The article about hutsuls «Wonderland» from the November issue of the magazine «National Geographic Ukraine" has won an award of The Best Edit of global family magazine National Geographic. This article is the first Ukrainian material presented on the cover of Ukrainian National Geographic. The author is Katerina Panova, the photo is made by Alex Furman.

LANGUAGE POLICY AND INTERCULTURAL COMMUNICATION AS A FACTOR OF STABILITY IN MODERN WORLD

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S.V. Podolkova – EL Adviser

Language is a tool given to a human to be able to contact with the world. Understanding the language of a person of different culture is the first step to understanding his character, mentality and nature of his actions. It is the first step towards intercultural cooperation.

Each language is a kind of mirror of culture, which reflects not only the real world that surrounds a person, not only the conditions of life but also social consciousness of the people, their national character, traditions, morals, values. People understand each other through language. Difficulties arise when the interlocutors speak different languages. The notion of intercultural communication concerns the aspects given below.

Misunderstanding the language often leads to serious conflicts at the international level, so the task of cross-cultural communication is to prevent it. As Goethe said: «He who is ignorant of foreign languages knows not his own».

Intercultural communication is a dialogue between representatives of different cultures. A person must know certain linguistic stereotypes of different nations, their specific rules of behavior, habits, etc. For example, in Ukraine, handshake is the main form of greeting. However, in some countries giving a hand to a woman is not acceptable, you should wait until she does it first. In France and Mediterranean countries it's common to kiss on cheeks. In Latin America the greeting is made by hugging. So it's very important to know national traditions and customs of the country if you don't want to get into the comic or unpleasant situation.

The important role in the development of intercultural communication is given to a language policy. It helps organize language in the society and resolve any conflicts. Nowadays the language issue is topical on the international political arena as one of

the possibilities to confirm the identity. The dialogue of cultures is possible only when maintaining the own cultural code of each culture. The former French prime minister Lionel Jospin claimed, that language policy was cement and value of the Republic on which it was built. In some countries bilingualism or multilingualism policy is conducted.

Language policy defines the use of language in its dissemination (mass media, book publishing, education and public administration). In our opinion the stability of the country depends on the adoption of a single official state language.

Usually official language is the language of the national majority: English in the UK, French in France, Russian in Russia. In such cases the need for mutual understanding for most people is satisfied but minorities have to put up with bilingualism and possibly even oppression of their rights.

In modern world the international contacts are highly developed, the implementation of thousands of business projects everywhere means that the process of intercultural communication has long gone beyond diplomacy and cultural exchange.

Great importance in the process of intercultural communication gets the role of an interpreter who acts as a mediator because of having a sound knowledge of the language, culture and national traditions. So the interdependence and interrelation of teaching foreign languages and intercultural communication is quite clear.

In order to ensure stability in a society, young people should realize that each foreign language class is a touch to another culture, the practice of intercultural communication because even one foreign word reflects the culture of another nation. Each word is conditioned by national mentality of understanding the surrounding world.

МОВА - ФУНДАМЕНТ НАШОГО ЖИТТЯ

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Однією з міжнародних мов є англійська. Значення англійської мови в сучасному світі важко переоцінити. Адже не можна ж не зважати на вибір більше 1 мільярда людей, які її використовують. І якщо для половини з них вона є рідною, то близько 600 мільйонів вибрали саме її як іноземну. Незважаючи на різноманітні її варіанти і наявність специфічних особливостей для кожної національності, англійська мова залишається лідером на нашій земній кулі. Але в наш час крім «чистої» англійської мови, значне поширення набуває поняття «білінгвізм».

Білінгвізм (двомовність) – специфічний стан суспільного життя, при якому спостерігається і є визнаним факт функціонування й співіснування двох мов у межах однієї держави або "співіснування двох мов у рамках одного й того ж мовленнєвого колективу, який використовує ці мови у відповідних комунікативних сферах, залежно від соціальної ситуації та інших параметрів комунікативного акту". Вважається, що двомовність позитивно позначається на розвитку пам'яті, вміння розуміти, аналізувати та обговорювати явища мови,

Також, не менш важливе місце посідає в нашому житті поняття «лінгва-франка». ЇЇ визначили як мову, що використовується як засіб міжетнічного спілкування у певній сфері діяльності. Історично термін лінгва-франка вперше став використовуватися для позначення змішаної мови. Згодом, термін «лінгва-франка» розуміють як будь-який усний допоміжний засіб міжетнічного спілкування.

Загалом, в наш час питання найпоширенішої мови в світі, питання змішаних мов чи панування двох мов одночасно в межах однієї держави викликає безліч дискусій та обговорень. Все це є досить важливим як для конкретно нашої держави, так і для усього світу в цілому.

INFORMATION SPACE: THE ROLE OF MASS MEDIA IN SHAPING PUBLIC OPINION

N.V. Rudenko

Contemporary life is impossible without mass media, without the possibility to get information in no time. We are dependent on them looking for the news and accurate facts, trying to find solutions for different social problems, seeking for the opinion of public people and politicians. Possessing the most powerful weapon (information), mass media form public opinion, set the framework of social discourses and perform a key role in developing a culture of peace and non-violence being the guarantee of a safe world for everyone.

Until recently mass media were defined as comprising the following: books, newspapers, magazines, recordings, radio, movies, television and the Internet. In the era of digital technology any medium used to transmit mass communication messages created by people to a large audience or market is mass media.

The ability of the media to reach a wide audience with an influential message has the power to have a great social and cultural impact upon society. Marshall McLuhan uses the phrase "the medium is the message" to stress that message distribution can be even more important than content of the message itself.

In a democratic society the Universal Declaration of Human Rights guaranties every person the right to get truthful information about every aspect of life as well as express our personal opinion freely. But the question is whether every bit of information we receive through the media can be reliable.

Basic functions of mass communication include: informing, persuading and entertaining. Among them managerial function of mass media must be mentioned as that of performing a vital and crucial role in society. Mass media are called the Fourth Estate, being one of the elements of democracy along with the legislative, executive, and the socioeconomic branches that characterize a society. In this context, it is important for them to be both a

watchdog of the elected officials' public behavior and a gatekeeper of popular viewpoints as they report on the events in the world.

Therefore, mass media are especially relevant to a modern society because without them, we would never know what is happening around us and would be left without the moral guide and ethic values important for uniting a society. The point is like all opinion makers, the mass media has both a duty and a responsibility towards the community and this is the reason it is considered to be a vital part of modern democracies.

Again, there is a threat of media presenting slanted views arising from self-censorship by members of the media in the interests of the owner, or in the interests of their own careers. We should not forget that some of the media are controlled by influential people, companies or political parties, so the information can be biased and serve the interests of the individuals or organizations. In this case the media are used for shaping some particular social opinion and cause the public reaction they need. With the help of distorted or wrong information they try to manipulate people's attitude to the situation, giving its recipients no chance to analyze real facts or form their own ideas and views.

It is very important to get complete and accurate data via the media. We should understand how dangerous information wars can be, when a great number of people deprived of true facts, perceiving the situation through some other's eyes get wrong ideas and are programmed to perform particular actions.

Speaking about the media as the Fourth Estate the main task of them is selecting, conveying and commenting on the most important events helping an average person receive unbiased information and understand the present situation in their own country and learn about other world events. Awareness of the society depends on the criteria the information data are picked and also on the way and emotional level they are presented to public. But still we must be critical consumers of the mass media product and remember that the news is very often exaggerated and contradictory, so it is impossible for an individual to see into the matter without analyzing different sources and studying experts' opinions.

INFORMATION SPACE: PROBLEMS OF ITS RELIABILITY

A.V. Spychak – Sumy State Pedagogical University, group – 222
N.V. Rudenko – E L Adviser

Information space plays a very important part in students' life. Every day we look for new information, find it and trust it. But the questions are: is the information we use reliable, and what is reliability of information?

First of all, reliability is the ability to reflect information, processes and phenomena occurring in the outside world objectively. Information that bears unmistakable and true data with no hidden or random errors (human or technical means failures) is considered to be primarily accurate.

In the formation of Ukrainian national information space, in addition to traditional media, now an active role is played by the new electronic media. According to modern scholars, the most important are the following: cable TV, teleconferences, e-mail and the Internet.

If we list all sorts of information sources from the most to the least reliable ones we can see that the first place must be occupied by print publications that are time-tested, have proven track record and are used by experienced professionals.

The second place should be given to the media that include television, radio, advertising, public speaking, etc. This is a very convenient form of information, but today we often get false facts, especially when the media want to influence their recipients' opinion on purpose.

I would like to give the last place to the Internet technologies that occupy an important place in the modern world information space. The Internet is the world's largest computer network, marked by the speed of information dissemination.

Though millions of people around the world use the Internet every day, we should always check the information we come across. We should refer to the printed publications that are approved and verified, and that is the way to check doubtful information from the Internet as we want to be well-educated and successful people in our careers and achieve desired goals.

LEARN TENSE FORMS WITH SCHEMES-STICKS

O.D. Nebohina - MSS№2 named after D.Kosarenko

We learn while living. Human comes to the earth and starts studying. It happens with the help of glance, touch, smell and taste.

We can see a baby liking something interested him. A bit older baby touches a new thing, tests it and and tries to put it into pieces to know more about its property. There is a natural process of world's cognition – if the thing is interesting, so it is explored.

Glance, smell, taste and touch are are natural human properties, according to our mind that is successful – what is natural. We believe, that touch and glance are valuable parts in learning English tense forms.

According to our mind schemes-sticks can help English learners make easier to receive and systematize information, but also reproduce and use it practically, while speaking, when necessary. Schemes-sticks give an opportunity to examine a tense form as a whole, which consists of several interrelated parts.

Let's see a process of learning English grammar from the creative point of view. English is a world, which makes an interest on a child (person) and a tense form is a thing which a child (person) is found of and can touch and glance.

Like a child explore a world with a natural interest, so a person can be interested in exploration English tense-forms with natural curiosity using schemes-sticks.

On our mind successful process and a result of l learning can be in a case of natural condition. So, it is better to organize a presentation moment of a tense form naturally. We believe, the best way of it can be by means of schemes-sticks.

It is very important for studying process to include several and more pupils while the lesson. Schemes-sticks are of different colour,so it alouds to organize, keep and awake pupils' interest and intent to the lesson process. Also, schemes help to be pupils attentive to the answers of their classmates, that is to practice audition skills. Children become able to hear, understand and be ready to react on others' answers, make their own point of view and besides, express their own one.

Pupils fell positive themselves and the importance of their point of view. Schemes-sticks further good mood in a class, that is necessary for successful study process and helps teacher to make positive relations with his class.

СЕКЦІЯ 2 ДЕМОКРАТИЧНЕ СУСПІЛЬСТВО ТА ПРАВА ЛЮДИНИ: ОСОБИСТІСТЬ ТА СУСПІЛЬСТВО

HUMAN RIGHTS PROTECTION INSTITUTE OF JURY
A. Yeremenko-Sumy State University,group U-24
V.E.Pronyaeva-EL Advisor

Development and formation of legal state, consolidation of democratic principles of governance is impossible without recognizing of human rights and freedoms in Ukraine. Today in our country an acute problem of protection of human rights exists as a result of low level of economic development, instability in the socio-political and legal areas, lack of effective approaches to legal education of the individual. Citizens do not know their rights, do not have basic skills to use their rights and make demands to the state or other institutions for the restoration or protection of their rights.

Decisive in this sense are human rights, especially the right to judicial protection provided by the Article 55 of the Ukrainian Constitution. Realization of this law provides public confidence in the judiciary. Unfortunately, the way available today in Ukraine is the way of justice characterized by low levels of trust among citizens. Thus, we need to introduce alternative forms of justice. One of these forms is the Institution of the Jury.

A significant number of scientists believe that the presence of the jury in the legal system is one of the major gains of democracy. Respect of human rights is a key national idea of all democratic countries. Regardless the formula of the national idea a person with his interests, rights and freedoms must be in the center of it.

The institution of trial by jury is one of the keys to ensure effective protection of human rights. Its introduction in Ukraine is extremely important and relevant. In the country there is a problem of the return of confidence to the judicial system, and the institute of legal proceedings is really able to return that trust. Thus, a jury can actually fix the situation. This institute, providing independence of justice, helps to protect the rights and interests of the individual in criminal proceedings and therefore can be considered as a guarantee against unreasonable conviction of the innocent.

Scientists believe that one of ways to stop the degradation of justice is to force lawyers and prosecutors to remember what is the adversarial of litigation.

FREEDOM OF SPEECH IN A DEMOCRATIC SOCIETY

T.I. Riznitska – Sumy State Pedagogical University, group – 222
N.V. Rudenko – E L Adviser

Democracy is the most challenging form of government both for politicians and for the people. This is the form of government, where a constitution guarantees basic personal and political rights, fair and free elections, and independent courts of law. One of the main objectives of this is to develop a clear system of rights and responsibilities of people which could regulate the relationship between the state and society.

The Universal Declaration of Human Rights proclaimed on December 10, 1948 by the General Assembly of the United Nations states in the Article 19: "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media". Man is free in his actions if it does no harm to other people.

The importance of free speech as a basic characteristic of a society cannot be overstated. The governments that neglect free speech can destroy the creative instincts of their people. Besides, the freedom of speech is the single most important political right of citizens and the basis of this right is freedom of the press. Without free speech no political action is possible and people cannot resist injustice and oppression.

According to *Freedom of the Press index*, only 14.5 percent of the world's citizens live in countries that enjoy a free press. In the rest of the world the media is in some way affected by governments. Speaking about current state of freedom of the press it is one of the central problems of the media and of democratic society on the whole. This applies to Ukraine as well, and the majority of journalists surveyed in 2012-2013 claimed the greatest pressure of censorship concerns political issues and criticism of the government by journalists. Very often modern newspapers and TV programs are full of trivial news such as celebrity gossip or numerous scandals, which are high on sensationalism but low on information.

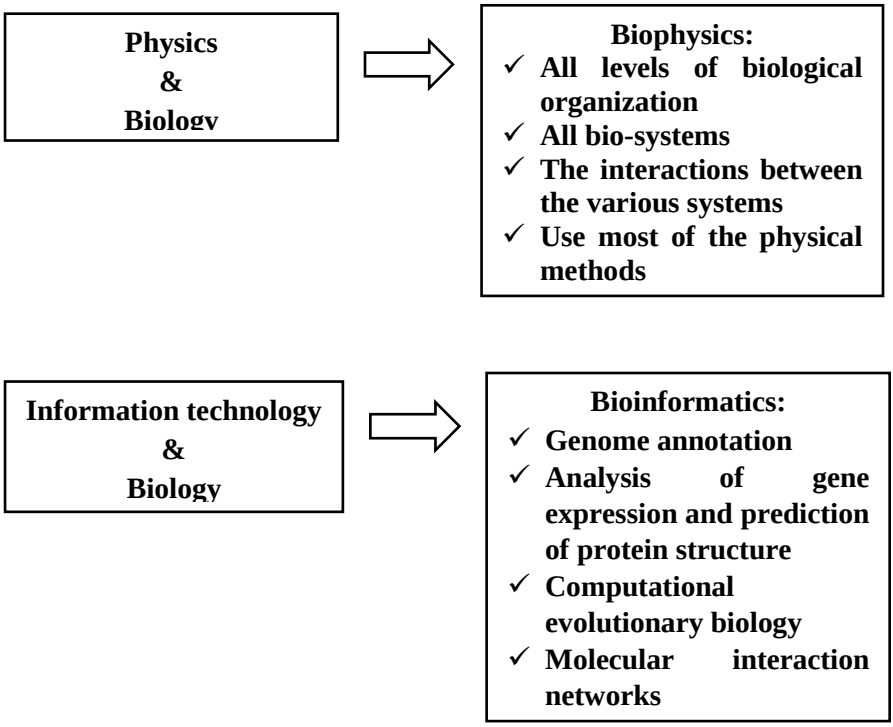
INTERDISCIPLINARITY IN TODAYS SCIENCE

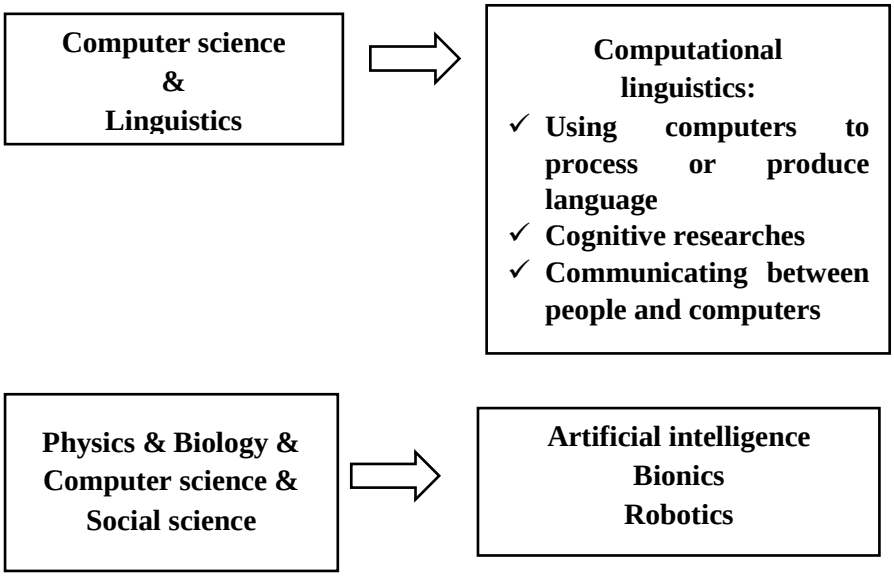
M.A. Semenikhina –
Sumy State Pedagogical University, group F – 4
M.V. Chykalova – E L Adviser

Nowadays the interdisciplinary scientific fields are really interesting for researchers. We are living in the world, where any science cannot be thing-in-itself. Some greatest things are between physic and biology, chemistry and mathematic, IT and linguistic, biology and IT, etc.

Interdisciplinary science helps us better understand human and nature, and often great discoveries are exactly in boundary of sciences. On the other hand, interdisciplinary researches are effective for applied things. This is the development of science in breadth.

The target of this article is to introduce some problems of some interdisciplinary sciences and describe their kinds.




Computer science
&
Linguistics
Computational linguistics:
✓ Using computers to process or produce language
✓ Cognitive researches
✓ Communicating between people and computers
Physics & Biology &
Computer science &
Social science
Artificial intelligence
Bionics
Robotics

СЕКЦІЯ 3 ТЕХНОЛОГІЇ, ДРУЖНІ ДО ЛЮДИНИ ТА НАВКОЛИШНЬОГО СЕРЕДОВИЩА

TECHNOLOGIES FRIENDLY TO PEOPLE

O. O. Khytrenko – SumyStateUniversity, group SU – 31
D. O. Marchenko – E L Adviser

The problem of environmental pollution is very urgent today. It`s the greatest trouble of people of all ages. Our planet must be saved; people must do something to prevent the destruction of our home.

Environmental technology is the application of one or more of environmental, green chemistry, environmental monitoring and electronic devices to monitor, model and conserve the natural environment and resources, and to curb the negative impacts of human involvement.

Technologies friendly to people is a rapidly growing field that focuses on new scientific and technical methods that benefit the earth. This involves both the development of new technologies and the improvement of existing ones.

Environmentally friendly technology utilizes many methods for reducing the impact that various activities have upon the earth.

Energy is one well-known area of green technology. Sustainable sources of energy include wind power, hydroelectric power, biofuels, and solar energy. These environmentally friendly technologies can now be used to power homes, businesses, and even small electronic devices. Solar energy is eco-friendly because it is always available abundantly and will continue to harvest energy regardless of how much we use of it. Fossil fuel such as gasoline on the other hand, is not sustainable because eventually it will run out and we will have to find alternative energy.

As awareness of our impact on the environment increases, environmentally friendly technology will likely expand as well. The future of this field may see innovations we can’t yet begin to fathom as society strives to live lightly upon the earth and reduce and repair the damaging impacts of our ever-increasing population.

VINCENT CALLEBAUT: PROJECTS AND BUILDINGS IN THE WORLD

T.V. Marchenko, group E-21
O.R. Gladchenko, EL Adviser

Today the world is concerned with three main issues: global warming, the price of oil and food crisis. I want to talk about the first item, because humanity has decision today.

Vincent Callebaut is a French architect who creates a "green" projects for the future "Ecopolis", combining architecture with biology, information and communication technologies. His famous projects:

- Coral Reef project;
- Lilypad;
- Hydrogenase;
- catalyst for clean air;
- project Dragonfly and so on.

Eco Village "Coral Reef" is a settlement for thousands of Haitian families who was affected by a major earthquake in 2010. This village has the shape of a coral reef. The village is designed that each family will have the own plot of land, where they will grow edible plants, and green area for recreation. The foundation is designed so as to absorb any earthquake wave power. Roofs of houses, roofs of balconies and arbors will convert thermal energy. This village will use various renewable energy: the energy of ocean currents, wind and solar energy. Giant wind turbines will generate power too, they will be placed on a large tropical garden.

Lilypad is the island of the future. The shape of the island is very similar to a lily and the architect named it Lilypad. Sea level will increase significantly according to forecasts of climatologists in the next hundred years, and many people living in the lowlands will be forced to find new homes. The offer of Callebaut is a fully autonomous floating city, where 50 thousand people can live. The center of Lilypad is the lake, which will collect and purify rainwater. This "city of the future" has zero carbon emissions into the

environment and is powered by renewable energy sources, including sunlight, wind and tidal energy.

Hydrogenase is the transport system of the future, it is eco-friendly aircraft. Hydrogen is a fuel for it. Hydrogen will receive from marine algae, which are converted into carbon dioxide under sunlight. It can lift 200 tons of cargo and will be able to reach a speed of 175 km/h. Hydrogenase will win in the competition with plane or car concerning environment and low costs.

Catalyst for clean air includes public galleries and meeting rooms. It was built on the territory of canals and abandoned railroad in the 19th district in Paris. It is a public equipment dedicated to promote the last innovations on the theme of sustainable development in urban area in terms of housing or transport. The role of it is to apply all the renewable energies so as to fight against the Parisian smog.

This construction was called "Dragonfly", because the main part of it is the wing of a dragonfly. Dragonfly sets up along the East River at the South edge of the Rooselvelt Island in New York between Manattan's Island and the Queens' district. The height of "Dragonfly" is 600 m (with antennas - 700 m), or 132 floors. There are 28 fields for growing a variety of crops and farm animals inside it. Of course, there are offices, apartments, food market and water taxi.

Many scientists say that humanity will not be able to live in the world, but the buildings by Vincent Callebaut will help us to deal with global environmental problems, because they use only renewable energy. People, who will live there, will feel very comfortable, because the conditions are very similar to the earth.

Unfortunately only few of the projects were realized today.

ENVIRONMENTAL PROBLEMS

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O.R.Gladchenko – E L Adviser

The poisoning of the world's land, air, and water is the fastest-spreading disease of civilisation. It probably produces fewer headlines than wars and floods, but it is potentially one of history's greatest dangers to human life on earth. If present trends continue for the next several decades, our planet will become uninhabitable.

Overpopulation, pollution and energy consumption have created such planet-wide problems as massive deforestation, ozone depletion, acid rains and the global warming that is believed to be coused by the greenhouse effect. The seas are in danger. They are filled with poison: industrial and nuclear waste, chemical fertilizers and pesticides. The Mediterranean is already nearly dead; the North Sea is following. The Aral Sea is on the brink of extinction. If nothing is done about it, one day nothing will be able to live in the seas.

Every ten minutes one kind of animal, plant or insect dies out for ever. If nothing is done about it, one million species that are alive today will have become extinct twenty years from now.

Air pollution is a very serious problem. In Cairo just breathing the air is life threatening- equivalent to smoking two packs of cigarettes a day. The same holds true for Mexico City and 600 cities of the former Soviet Union.

LIFESTYLE: THE POSSIBILITY OF ECOLOGIZATION

M.A. Korovai , group Edm-21
O.R. Gladchenko – EL Adviser

Historically, until recently, society's attitude to nature was of the nature of the consumer. The man was interested mainly as a source of resources to meet the needs of production and consumption. Now it's time to move to another culture, opposite the former, which focuses not only on consumers, but also support the natural environment in a state fit for current and future generations, as well as other organisms that inhabit the planet.

The main components of the reproductive mechanism of the ecologization of national economy included:

- Reproduction of the environmental demand;
- Reproduction of environmentally oriented production base;
- Reproduction of environmentally oriented human factors;
- Reproduction of ecological reasons.

To ensure that society felt the need to use environmentally friendly products, you must cause the misconception about fashion, which over time, re-created a style influenced very significant positive results that will be displayed on the physical, moral health of society and the environment.

The main driving force in this "war" for the preservation and reproduction of the environment should be a state that will create the necessary legal framework to support and implement environmental projects. Since advertising is the engine of progress and greatly influences the subconscious citizens needed government support for the advocacy of environmental products, healthy lifestyle and open access to information about properties harmful components that make up products; education in public understanding of the need to preserve natural resources by supporting recycling.

So, at this stage humanity should think about what we needs to do to improve this situation, what we can change. When every citizen is interested to live in a clean environment admiring its scenery, then it will change the way of life from fast and convenient on environmentally directed.

EUTROPHICATION

N.V. Petriyako – group EKm-31
L.P. Yarmak – E.I. Adviser

The process of eutrophication is natural. For many lakes, as they age over centuries, there is a buildup of nutrients, sediment, and plant material, which slowly fill the lake basin. Eventually, the process ends and the basin becomes colonized by terrestrial vegetation. The timing of natural eutrophication is highly variable and depends on the characteristics of the basin, watershed, and climate.

Pristine aquatic ecosystems function in approximate steady state in which primary production of new plant biomass is sustained by Nitrates and Phosphates released as byproducts of microbial and animal metabolism. This balanced state can be disrupted by human activities that artificially enrich water bodies with N and P, resulting in unnaturally high rates of plant production and accumulation of organic matter that can degrade water and habitat quality. These inputs may come from untreated sewage discharges, sewage treatment plants or runoff of fertilizer from farm fields or suburban lawns. In some cases the climax stage of algae blooms can release toxic chemicals such as acid to the aquatic environment, creating elevated metabolic risks to a variety of fish and marine mammals.

Depending on the degree of eutrophication, severe environmental effects can develop, which degrade water quality. For example, increased phytoplankton biomass can decrease clarity, reduce levels of light, and decrease levels of oxygen, all of which ultimately have negative consequences for organisms that live in the lake.

One more negative impact of eutrophication and increased algae growth is a loss of available oxygen, known as anoxia. These anoxic conditions can kill fish and other aquatic organisms such as amphibians. However, how does eutrophication actually lower oxygen levels when it is common knowledge algae produce oxygen? It is true algae produce oxygen, but only when there is enough light. Eutrophication reduces the clarity of water and underwater light. In

eutrophic lakes, algae are starved for light. When algae don't have enough light they stop producing oxygen and in turn begin consuming oxygen. Moreover, when the large blooms of algae begin to die, bacterial decomposers further deplete the levels of oxygen. As a result, eutrophication can quickly remove much of the oxygen from a lake, leading to an anoxic — and lethal — underwater environment.

The progression of eutrophication events for ponds and lakes can eventually create detritus layers that produce successively shallower depths of surface waters. Eventually the water body can be reduced to a marsh or bog, whose plant community is transformed from an aquatic environment to a recognisable terrestrial ecosystem. While this system may first emerge as a plant succession of marsh grasses and related aquatic forbs, the community may evolve to be more of a bog or fen, and finally a vernal pool or meadow. This progression can clearly spawn radical changes in the entire ecosystem, which began as an aquatic habitat, and has been transformed into a fully terrestrial community, albeit inhabited by a number of mesic plants and water oriented animals such as amphibians.

Laws and regulations have been established that support high water quality standards. Often they specifically limit nitrogen and phosphorus inputs, simply because the effects of eutrophication, though reversible, can be quite devastating. Lakes with lower nutrients have lower algae concentrations, are generally clear, and are considered to be high-quality water resources and recreational sites. However, the management of these resources includes a complex set of interactions from within system processes to watershed interactions to even larger, global issues. Therefore, the continued effort to control eutrophication will require ongoing cooperation of citizens, scientists, managers, and policy makers.

WASTE MINIMISATION AND TREATMENT IN AN ELECTROPLATING PRODUCTION FOR PREVENTION AND CONTROL OF POLLUTION

D.S. Balabuha – Sumy State University, group Ekm-31
L.P .Yarmak – E.I. Adviser

Electroplating generates all three forms of waste – liquid, gaseous and solid. Of these, liquid wastes are predominant. Such liquid wastes include : spent chemicals and solutions such as acids, alkalies, cleaning agents, bath chemicals comprising plating chemicals as well as additives such as brighteners, levellers etc. and rinse waters, which may contain some or all of these depending upon sources, method of plating and housekeeping practices.

Gaseous wastes include solvents and vapours from hot pre-treatment and process baths. They include acid alkali mist, Volatile Organic Compounds (VOCs). In some cases, mists and VOCs may contain metals in addition to process chemicals.

According to one estimate, approximately 30% of the solvents and degreasing agents

used can be released as VOCs when baths are not regenerated.

Solid wastes include, sludges generated from wastewater treatment, sludges from cleaning and bath tanks and various residues like, cleaning powder, buffing compounds, spent anodes and various scraps. Unused chemicals, spent resins from ion-exchange / metal recovery systems also contribute to solid waste. Much of the solid waste contain hazardous and toxic substances.

Waste minimisation therefore occupies the most important position in the control of pollution from electroplating and overall protection of the recipient environment – water, air and land (soil).

Waste minimisation in an Electroplating unit may include any one, combination or all of the following:

1. Minimisation of Wastewater Generation

Numerous studies reported in literature also point out to several approaches, which can be briefly stated as; introduction of rinse water recirculation with automatic benefit of chemical recovery

and reuse;static rinse water recovery; avoiding and controlling spillage – single largest cause of high wastewater generation in the unorganised sector. By using troughs between tanks and using well defined linear configuration in place of barrels and avoiding haphazard rinsing and washing will ensure very significant reduction in quantum of wastewater generated; introduction of cascade and/or counter- current rinsing; use of fogging and spraying on objects (rack plating)

2. Minimisation of Gaseous Emission

Except a few states (e.g., Karnataka and Maharashtra), State Pollution Control Boards do not generally require electroplating units to provide any measure for elimination or control of gaseous emission. As discussed earlier, gaseous emission takes place as vapours from hot baths, normal evaporation from cold baths do not constitute significant source of such emission and VOCs from organic cleaning baths.

Use of collecting hoods and scrubbers can significantly control or eliminate vapours from baths. Collecting arrangements have improved substantially but older plants either have no collecting hoods or only side suction arrangement, which are not effective at all. Completely covered baths are ideal solution but they are useful in completely automated plants as used in Europe and parts of North America. However use of top suction hoods with properly designed scrubber system certainly controls much of the gaseous emission. As far as emission of VOCs are concerned, ideal solution is not to use those with high environmental concerns even if they are used, the best practice is to keep the tanks fully covered at all times and using vapour arresting devices.

3. Minimisation of Solid Waste

Major part of solid waste (that too, hazardous) is sludge from waste water treatment plant. Therefore, if measures are taken to minimisewaste water generation by adopting methods stated in sub-para 1 above, waste water sludge generation is minimised. Other constituents of solid waste are: (I) spent anodes, (ii) tank sludges, spent carbon filters and (iv) empty containers of chemicals etc.. The last-named one is usually sold to scrap dealers. Tank sludges and

spent carbon filters may contain hazardous metal salts. While the quantity depends on production, disposal practices should conform to regulatory requirements pertaining to hazardous substances. Therefore using non-hazardous chemicals will lead to minimisation of hazard in solid waste from process chemicals. Use of Cyanide free process (e.g. Alkaline Cyanide Free Zinc plating), use of trivalent Chromium in place of hexavalent Chromium are examples of such hazard minimisation.

4. Minimisation of Noise Emission

Plating activity by itself does not produce significant noise, except barrel plating of small objects. Major source of noise is operation of air blowers used for blowing air in plating (for Nickel Plating) and in pre-cleaning operations . Such noise is minimised by putting the air blower in a separate room with noise muffling arrangements. In many plants and factories, it was observed that high ambient noise level in plating areas is caused by activities other than electroplating such as machining, stamping, metal forming, forging, etc. etc. Noise reduction in such activities is however, outside the purview of this study.

The Best Available Technique (BAT) means the most effective and advanced stage in the development of activities and their methods of operation, which indicate the practical suitability of particular techniques for providing in principle the basis for minimum emission values designed to prevent and, where it is not practicable, generally to reduce emissions and the impact on the environment as a whole. Ideas to implement some specific BAT measures are summarized herewith under the heading of: pre-treatment activity; plating activity.

Note : In view of the availability of different designs and systems, the details of costs can vary. The industry is encouraged to acquire the latest cost information from the equipment supplier if any cleaner production initiative in the above is taken up.

CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

V.V. Storozhev – Sumy State University, group EKm-31
L.P. Yarmak–E. I. Adviser

The threat of global climate change poses an unprecedented challenge to humanity. Although climate change is potentially important, it is crucial to recognize also that (especially for the developing countries), there are a number of other priorities that affect human welfare more immediately – such as hunger and malnutrition, poverty, health, and pressing local environmental issues. In this context, predictions about climate change, its impacts, and the costs of mitigation are important for the policy – making dimension, because climate change issues reside within broader questions about sustainable development. One major objective of human development is sustainability, and the pursuit of greater precision in climate prediction can help with progress toward this goal.

The state of the environment is a major worldwide concern today. Pollution is perceived as an especially serious threat in industrialized countries, where the quality of life had hitherto been measured mainly in terms of growth in material output. Meanwhile, environmental degradation has become a significant impediment to economic development and the alleviation of poverty in the developing world. In this context, sustainable development (SD) is an overarching objective for human society that has emerged at the end of the twentieth century. The interaction between SD and global climate change is especially important, in view of the wide – ranging impacts that the latter is likely to have. Furthermore, the UNFCCC has recognized this relationship explicitly in Article 2, which states that the stabilization of greenhouse gas concentration «should be achieved within a time – frame sufficient to enable economic development to proceed in sustainable manner»

What is the science of climate change? The primary source of energy that drives the global climate is the radiation from the Sun. Incident solar energy is absorbed by Earth's surface, and re-distributed by atmospheric and oceanic circulation. In turn, infrared

radiation is re-emitted from the Earth into space, to maintain a zero average net energy balance between the top of the atmosphere and outer space. To maintain its long- thermal equilibrium, the Earth must re-radiate back to space, on average, the same amount of energy that is adsorbed. It does so by emitting longwave infrared radiation. The amount of longwave radiation emitted by a warm surface depends on its temperature and how absorbing it is. If the Earth had a perfectly absorbing surface, it would re-emit the required 235 Wm-2 of thermal radiation at a rather low temperature of about -19`C. This is much colder than the conditions that actually exist near the Earth's surface – where the global mean temperature is about -15`C. This apparent discrepancy arises from the natural greenhouse effect: because the Earth is not a perfect absorber, it must be about 34`C warmer than it would otherwise be, to re-emit the net 235 Wm-2 of radiation into space.

ACID RAIN. PROBLEMS AND SOLUTIONS

N.O. Vinichenko– Sumy State University, group Ekm-31
L.P.Yarmak– E.I. Adviser

Acid rain refers to a relatively new phenomenon, a form of precipitation that is acidic in nature. The result of human-induced emissions, acid rain has grave effects on the planet's flora and fauna and different ecosystems. The precipitation occurs when exhaust emissions of sulfur and nitrogen compounds react in the atmosphere.

Acid rain refers to precipitation, both wet and dry, that is acidic in nature. Precipitation like sleet, rain, snow or dry acidic components that have a pH of less than 4.0 is termed as acid rain. This phenomenon is the result of industrial and vehicular emissions of sulfur dioxide and nitrogen oxides reacting in the Earth's atmosphere.

Acid rain is associated with atmospheric pollution. Today, a myriad of highly deleterious environmental effects are being researched upon. The occurrence results in a precipitous pH value of around 4.0. Every subsequent decrease in the pH value is indicative of a greater acidic composition. Acid rain with pH readings well

below 2.4 are being reported consistently from industrialized areas, initiating the need for the development of smokestacks. The acidification is largely triggered by the increased presence of sulfur dioxide in the atmosphere. Emissions from the burning of fossil fuel, industry combustion, wildfires and volcanic eruptions add to the existent quantum of acid-producing gases in the atmosphere. The other causes are emissions from electricity generating plants and motor vehicles.

The harmful gases traverse across hundreds of kilometers before converting into acids, causing widespread ecological damage. It has an adverse impact on our forests, soils, flora and fauna that thrive in various ecosystems, and human health. The phenomenon has eliminated certain life forms completely, while adversely affecting the quality of soil biology and chemistry. The forest cover, too, has been extensively damaged, while the precipitation continues to threaten human health with the onslaught of premature death and specific particulate health effects. The phenomenon has not spared the inanimate either. It continues to threaten the survival of historical monuments and structures with the sulfuric acid induced flaking of limestone, marble, sandstone and granite.

The effects of acid rain on our ecosystem can be contained with awareness and education on the trigger factors of the phenomenon. Once these are addressed, the devastating effects can be curbed and remedied. Some of the prevention techniques to the problem include the use of Flue Gas Desulfurization or FGD in coal-burning power plants. This helps to filter the sulfur-containing gases and neutralize the same from the stack gases to obtain a pH-neutral that can be physically removed with the help of special 'scrubbers'. The pollutants can also be converted into industrial sulfates. Control of automobile nitrogen oxide emissions also helps to reduce the onslaught and address the problem with fervency.

ALTERNATIVEENERGYSOURCES

V.S. Bosenko – Sumy State University, group EL – 31
Ph. D. N. V. Malovana

Energy sources are very important for all of us. We all need different types of energy in our daily life to perform different tasks. We get energy from different natural resources like coal, petroleum, and electricity. Again, electricity comes from different sources hydro-electricity, thermal electricity and some alternate sources of energy like electricity from solar energy. Alarming Situation of Natural energy sources Stock Natural sources of energy are limited because of their limited stock. It takes several years in formation of natural energy sources but if the consumption of energy sources will be too more (like in current situation) than the rate of their formation, they will not last longer. Even the stocks of energy sources like petroleum are limited to certain areas and they have monopoly on petroleum market, resulting drastic increase in rates of petroleum during last decade.

Every day, the world produces carbon dioxide that is released to the earth's atmosphere and which will still be there in one hundred years time.

This increased content of Carbon Dioxide increases the warmth of our planet and is the main cause of the so called "Global Warming Effect". One answer to global warming is to replace and retrofit current technologies with alternatives that have comparable or better performance, but do not emit carbon dioxide.

We call this Alternate energy.

By 2050, one-third of the world's energy will need to come from solar, wind, and other renewable resources. Who says? British Petroleum and Royal Dutch Shell, two of the world's largest oil companies. Climate change, population growth, and fossil fuel depletion mean that renewables will need to play a bigger role in the future than they do today.

Alternative energy refers to energy sources that have no undesired consequences such for example fossil fuels or nuclear energy. Alternative energy sources are renewable and are thought to

be "free" energy sources. They all have lower carbon emissions, compared to conventional energy sources. These include Biomass Energy, Wind Energy, Solar Energy, Geothermal Energy, Hydroelectric Energy sources. Combined with the use of recycling, the use of clean alternative energies such as the home use of solar power systems will help ensure man's survival into the 21st century and beyond.

From an environmental perspective, solar power is the best thing going. A 1.5 kilowatt PV system will keep more than 110,000 pounds of carbon dioxide, the chief greenhouse gas, out of the atmosphere over the next 25 years. The same solar system will also prevent the need to burn 60,000 pounds of coal. With solar, there's no acid rain, no urban smog, no pollution of any kind.

Societies have taken advantage of wind power for thousands of years. The first known use was in 5000 BC when people used sails to navigate the Nile River. Persians had already been using windmills for 400 years by 900 AD in order to pump water and grind grain. Windmills may have even been developed in China before 1 AD, but the earliest written documentation comes from 1219. Cretans were using "literally hundreds of sail-rotor windmills [to] pump water for crops and livestock."

As the primary source of biofuels in North America, many organizations are conducting research in the area of ethanol production. On the Federal level, the USDA conducts a large amount of research regarding ethanol production in the United States. Much of this research is targeted toward the effect of ethanol production on domestic food markets.

Since the late 1980s, there have been several attempts to investigate the possibility of harvesting energy from lightning. It has been proposed that the energy contained in lightning be used to generate hydrogen from water, or to harness the energy from rapid heating of water due to lightning, or to use inductors spaced far enough away so that a safe fraction of the energy might be captured. In the summer of 2007, an alternative energy company called Alternate Energy Holdings, Inc. (AEHI) unsuccessfully tested a method for capturing the energy in lightning bolts.

STATE AND PROBLEMS OF GREEN TOURISM MANAGERS' TRAINING IN SUMY REGION

D. Tkachenko – Sumy State Pedagogical University,
group 943
M. M. Chykalova – E L Adviser

Nowadays Ukraine and Sumy region, in particular, have extremely high potential in the development of green or «rural» tourism. However, despite this fact, the Sumy area is not a «place of pilgrimage» for international tourists. Our manors are the most popular only among national guests. One of the reasons of such situation is insufficient vocational training of owners and managers, working in Ukraine's hospitality industry. That is why training of highly qualified specialists, who can compete both in national and international tourism service market, is one of the most important aspects of the formation and development of green tourism in Ukraine.

American school is considered to be the most interesting for us, it combines both progressive educational systems of the old world and upgrading them on the basis of broad innovation.

Lots of interesting and useful information can be learned from the educational experience of the universities in Turkey, a country located in close geographical proximity to Ukraine. It has positive experience in the successful development of tourism in the problem of appropriate tourism infrastructure formation as well as the advertising campaign.

Green tourism marketing survey shows that the idea of rural tourism is ideal for business activities in rural areas, which in its turn will contribute into employment. It does not require a significant investments, numerous staff and modern infrastructure. Using the potential of human and natural resources will make it possible to monitor the development of green tourism by local residents. After all, they know better their own values, needs and available resources.

Taking into consideration the problems and factors affecting the development of green tourism in Sumy region, the following subjects should be stressed at the tourists' educational

establishments: psychology, ethics, foreign languages, marketing, pedagogy, public relations management, history, local history, etc. We should correlate theory and practice in tourism industry.

To make green tourism sphere function successfully, both legislative support and the appropriate legal framework (laws on tourism and relevant to the modern development of this sphere regulations) should be adopted.

Those Universities, which have licenses in tourism education, should organize short and long-term green tourism managers' training courses. It would be reasonable to involve the students from the Sumy universities to marketing research of green tourism in the Sumy region and to develop effective advertising of Sumy green tourism in order to attract foreign tourists etc.

Thus, we can conclude that the training of qualified specialists and competitive managers in the sphere of green tourism at Sumy educational establishments is a reality. It contributes not only in the development of this field, but also to the overall economy of the region as a whole.

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THE INFLUENCE OF GARBAGE ON ECOLOGY

O.L. Borovyk– Sumy State University, postgraduate

Every day we throw things in the bin. It could be drinks cans, crisp, wrappers, paper, left-over food, broken toys, anything.Somebody else then takes it away and we never see it again: out of sight, out of mind.But have you ever stopped to think about where all that garbage goes? Does it vanish into space? Does it vapourise into nothing? We'd have to take a closer look.And when we really look at what we throw away, we can see that most of our garbage isn't really garbage at all, but rather reusable, recyclable materials. Every garbage bag contains valuable resources and energy that we are throwing away. Many of these things are made up of natural resources such as trees, coal, oil and aluminium and one day some of these resources will be used up completely.

Aside from all the wasted energy and valuable natural resources used to produce the materials we burn, dump and bury (often after only one or two uses), waste disposal has significant impacts on the environment.

Since we all produce garbage, we are all part of the problem. But we can also be part of the solution. We should think more about what we waste to protect the environment by saving energy, reducing pollution, cutting costs and preserving our natural resources.

The choices we make every day affect the amount and types of garbage we toss. When we rethink the way we live, reduce what we buy, reuse things instead of getting new ones, recycle and compost; we not only make less waste, we also save valuable natural resources and energy, and create less pollution.

The time has come for us to change our way of thinking; to place more value on the basic requirements for all life on Earth-clean air, soil and water and reduce our waste to help protect them. We need to start taking action and change the way we feel about and deal with waste.

HIGH-ENERGY-DENSITY SUGAR BIOBATTERY

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The rapidly growing demand for powering portable electronic devices is driving the development of better batteries with features such as enhanced energy-storage densities, high levels of safety, biodegradability and small environmental footprints.

The lithium-ion battery is often the system of choice because it offers a high energy density, has a flexible and light-weight design and has a longer lifespan than comparable battery technologies. The widespread use of metal-catalysed batteries also raises many concerns, primarily related to safety, toxic metal pollution and the availability of costly, limited, irreplaceable or rare metal resources.

Enzymatic fuel cells (EFCs) are emerging electrobiochemical devices that directly convert chemical energy from a variety of fuels into electricity using low-cost biocatalyst enzymes. Inspired by living cells that can utilize complex organic compounds, for example, starch and glycogen, sugar-powered EFCs represent the next generation of biobatteries. EFCs usually generate much higher power density. Most EFCs run on complex organic compounds (glucose, methanol, glycerol). Glucose can release up to 3,574 Ah kg^{-1}, which is 85-fold greater than the energy released by lithium-ion batteries (42 Ah kg^{-1}).

Sugars are appealing fuels for EFCs because they are abundant, renewable, inexpensive, non-toxic, and safe for storage and distribution, and carbon neutral over the entire life cycle. Sugar-powered biobatteries feature high energy-storage densities and high safety. Thus, these batteries represent next-generation micropower sources that could be especially useful for portable electronics. One of the greatest advantages of fuel cells is that they are open systems that use high-energy-density fuels (H_2, methanol, glucose).

Thus high-energy-density sugar biobatteries could represent the next generation of environmentally friendly power sources, because of their features, such as high energy density, safety and biodegradability.

ENVIRONMENTAL PROBLEMS

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Environmental problems can be found in all areas of the world, and they affect land, water and air.

Some of them result from what humans take from the environment, in the form of land for agriculture, and accommodation for a rapidly increasing population; mineral and fossil fuel resources; and timber. These problems include deforestation, erosion, damage to ecosystems and reductions in biodiversity. Other problems stem from what humans put into the environment, in the form of various pollutions. These issues include climate change, damage to the ozone layer, urban pollution, and acid rain.

Environmental Degradation

One of the most publicized aspects of degradation is deforestation. Deforestation can lead to soil erosion. On hill and mountainsides deforestation can lead to flooding and can also result in disastrous mudslides.

Air Pollution

This is a global problem that affects the atmosphere, oceans, lakes and rivers, and also land. Many human activities result in the release of toxic chemicals into the air or into water, which can go on to damage the environment or cause ill health in people.

Another cause for concern is depletion of the ozone layer, high in the atmosphere. This layer absorbs ultraviolet light, particularly the most damaging forms, minimizing exposure at ground level.

Global warming

Carbon dioxide (CO_2) traps heat in the Earth's atmosphere, and is the most important "greenhouse" gas. Did you notice raising air and ocean temperatures across the planet? This phenomenon is called "global warming" or "climate change."

Solutions

Solutions of many of these problems will require government action. Ordinary people can make their own contributions as well.

THE PROBLEMS OF RATIONAL NATURE RESOURCE MANAGEMENT

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V.E. Pronyaeva -EL Advisor

It`s well-known that the resources capabilities of the Earth are limited and the wants of people are unbounded. People use more and more resources to satisfy their needs, not thinking about the consequences of such actions. For example, one of them: even now the humanity feels the shortage of fuel resources. And many scientists predict the global resource crisis. That`s why the question how to save our planet for future generation was raised.

Nowadays to solve this problem is possible only living in harmony with nature. This is the main aim of the concept of sustainable development: the installation of balance between the needs of contemporary generation and protection of interests of future ones, including their right to live in safety and healthy environment. The one aspect of such kind of development is rational nature resource management. It is aimed at the security and economical use of resources, prevention of harmful consequences of human activity and reconstitution of the broken relationships in ecosystems.

The second problem is in the growth of industrial disasters. The statistics shows that the amount of them has been increasing dramatically since the 1970-th. The scientists explain this by the scientific and technical progress. So, are such disasters the payment for comfortable life and satisfaction of all our needs?

The third problem is connected with the weakening of control over the activities of entities against the background of economical instability. The biggest part of people don`t feel the importance of rational nature using. For instance, businessmen`s aim is to earn as more as possible than they have invested, so when there is a chance to save some part of income, he will do it regardless the harmful effect, that his actions will make on the environment. Another side of such behavior is in neglecting the technology of using and consuming of natural resources. Furthermore, the number of

recycling enterprises for example in Ukraine is too small. The Ukrainian enterprises use only 10-20% of secondary glass in its total amount.

The fourth problem: the legal system in the sphere of ecology and the mechanisms of its realization are imperfect.

In conclusion the main ways to solve the problem, that can do every person: to change the people`s minds to make them take care of nature, to be «eco-friendly»; to reduce or totally refuse using of one-time products, such as plastic, cellophane etc.; to treat economically fresh water, electricity, different fuel resources etc. The education of children should be aimed at upbringing the person, who has the active civil position and who takes care of everything that surrounds him. The adults should also lead by example to their people. The concern of nature should be popularized by the advertisement.

The private and state companies should organize the local receiving points of products that can be recycled: paper, glass, batteries etc.

Furthermore, the using of resources should be developed in the intensive way, not the extensive ones. So, the enterprises should improve the quality of using resources in the way of introduction the new resource saving technologies and using the waste of production by the producing the secondary products.

The state should organize the effective local state regulative authorities. For the entrepreneur the state impose fines, if there is any violation of «environmental laws» and for the enterprises that use the environmental clean technologies there are some grants and tax credits. The state should give the credits for short-term and long-term periods on favorable conditions for installation the resource saving equipment. The money for this also can be given by the foreign or national investors.

The state must create zones of reserves, national parks and parks in towns and cities.

So, in general for making the rational resource using management the most effective we should do it a usual part of our everyday life.

FOSSIL FUELS

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V.E. Pronyaeva – E L Adviser

One of the most discussed global problems nowadays is using fossil fuels. For the past hundred years we have come to relying more on that power source. It facilitates the industrial revolution and helps to turn the Western world into what it is today. On the contrary, unwise consumption of resources will cause a lot of problems in future. The fact is that we are running out of this resource considerably quickly. However, it will not happen tomorrow we are not able to rely on that source of energy to power our economy any more.

Demand on the fossil fuels is increasing rapidly all over the world. As soon as such countries with large population like China and India become more and more developed they intensify usage of the petrol. The stated goal of the Chinese government, for example, is to achieve level of development where every Chinese family owns a car. If this happen it would require more than the world's total oil production to satisfy people's needs. The competition for a limited resource keeps the price going up. People are already upset by the high fuel prices. The cost is predicted to go even higher in future. When this happens it is going to do real damage to the economies of developed nations that depend mostly on resources imported from overseas.

The biggest problem connected with that source of energy is the environmental damage which its obtaining causes. There is a destruction of ecosystems in both: getting it out of the ground and burning it as a fuel source. The threat of climate change has made it obvious that we should reduce the emissions of this resource.

Global warming is one of the most dangerous consequences of extra fossil fuels consumption brings about. The planet's

temperature is getting higher. This tendency is obvious and unmistakable. The previous 37 years have been warmer than a whole 20th century. The 12 warmest years on record have all occurred since 1998. The hottest period ever recorded for the United States was in 2012. Globally, the average surface temperature has increased more than one degree Fahrenheit since the late 1800s. Most of that increase has just occurred over past three decades. This problem was caused by overloading atmosphere with carbon dioxide, which traps heat and steadily drives up the globe temperature. Where does all this carbon come from? The answer is fuels we burn for energy (coal, natural gas and oil).

The issues given above explain why current technologies of getting and using fossil fuels should be replaced and retrofitted with alternatives that have comparable or better performance and do not emit carbon dioxide. For example: Biomass Energy, Wind Energy, Solar Energy, Geothermal Energy, Hydroelectric Energy sources. The exploitation of clean alternative energies such as the home use of solar power systems combined with the usage of recycling will help ensure human beings` survival in the 21st century.

ORIENTATION DU SYSTEME D'AUTOMATISATION DE PANNEAUX SOLAIRES DANS L'ESPACE ET ON OPTIMISE SON DESIGN

Etudiant Lopatka R., ESM31
professeur Aleksakhina T.A.

Cellules et modules solaires photovoltaïques ont basées sur ces largement utilisés comme une des sources d'énergie efficaces non polluants pour divers usages . Le principal problème de notre temps est d'augmenter leur efficacité . Pour cet usage on particulie de la gestion de leur position. Pour une efficacité maximale des modules PV doivent être orientées de sorte que les rayons du soleil qui tombe sur leur surface de travail sous un angle de 900 . Pour atteindre cette exigence est possible uniquement en utilisant des modèles spéciaux de rotation système de suivi de l'essieu pour le contrôle de position sontsem. Le système cellule solaire est un dispositif pour l'orientation des panneaux solaires ou solaire entretien lentille kontsentratorachy tourné vers le soleil. L'objectif de l'étude était de concevoir des systèmes d'automatisation orientation paneleyu solaire optimisation de l'espace de sa conception , le développement du système d'alimentation . Pour la réalisation technique de ces objectifs, il a été décidé d'utiliser le système de commande à microprocesseur , où le rôle principal de l'informatique et l'unité de commande effectue le microcontrôleur . Cela est dû aux raisons suivantes :

1) l'intégration plutôt de l'informatique et l'unité de commande ,
2) la combinaison optimale de calcul microcontrôleur de puissance et des unités périphériques,
3) puissance de calcul élevée et actions
4) systèmes à faible de des microprocesseurs.

Le principal avantage du système développé est la facilité d'utilisation , le faible coût, la facilité de montage et le réglage .

2 . L'inconvénient refroidissement supplémentaire d'éléments de circuit individuels , ce qui augmente ses paramètres de poids et de dimensions .

3 . Conçu dans le présent document , le régime relève le défi posé à son développement , et est correct en ce moment .

HOW TO HELP THE ENVIRONMENT?

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group 813
M. M. Chykalova – E L Adviser

Environmental problems have become global problems of the modern world. Our planet is in danger!

In modern society, people began to forget that the Earth is our common home. People sometimes do not realize what harm they cause to the nature by their actions and deeds. There are a lot of problems associated with the ecology of our planet.

When we talk about the terrible ecological situation in the world, each of us has to understand that this is the work for everybody.

The cleanliness and good ecology begins with each of us. Unfortunately, this thought comes to most of us too late. But we think that it is not too late to begin to change the situation.

Protection of nature is the mission of our century, the problem that has become social. Again and again we hear about the danger to the environment, but still a lot of us find it unpleasant but inevitable product of civilization, and believe that we will have time to cope with all the difficulties to identify.

Consequences of the lack of attention to the problem could be catastrophic. It is not only about the welfare of mankind and its survival. Especially disturbing is the fact that environmental degradation may be irreversible.

Civilization has a devastating impact on nature and the environment. But to reduce this negative influence means to unite our efforts.

Even if one person thinks about it a bit and changes your habits, it already helps the ecological state of the city, and therefore the entire planet.

Many people think, “How can I save the nature alone and how can I help it?” Everyone thinks so and does nothing. But if you follow a few simple rules, you can really help it.

What can we do to protect nature? The following actions are appeared to be rather simple:

- we can recycle newspapers, bottles and metal cans;
- we mustn't cut down trees;
- we have to plant more trees and plants;
- not to throw away trash that can be sent for recycling;
- to feed birds in winter;
- to protect wildlife, plants and trees and keep all water clean;
- not to use aerosol sprays;
- not to use chemicals in the garden;
- to turn off the light when you leave the room and save resources, such as water and gas;
- not to cut wild flowers;
- try to avoid buying plastic bottles etc., as they are hard to recycle;

People affect on the natural environment of their habitat not only consuming its resources, but also by changing the environment, adapting it to meet their practical and economic problems. In view of this human activity has a significant impact on the environment, exposing its changes, which then influence the man himself.

How to save the environment? Together we can find a solution:

1. Accept the laws toughening the control over the environment.
2. Increase funds allocated to environmental protection.
3. Refuse the application industry "dirty" technologies.
4. Tougher penalties for violations of environmental laws.
5. Ecological education of the population etc.

All of us, regardless of age, can help our planet. Each of us is responsible for the huge planet called Earth.

I think people must take care of our Motherland. Future is in our hands!

THE INFLUENCE OF FUEL AND ENERGY COMPANIES TO ENVIRONMENT

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Zolotova S. – EL advisor.

Today's changes in the environment are the negative result of human activities. Deforestation, drying ponds, construction the plants - leaded to global changes in our ecology. Energy sector consists ofextractive, convertible, transportablecompaniesand influences badlyhydrosphere, atmosphere, biosphere andlithosphere.

Energy efficiency, energy saving and resource saving are explored as a step to better environment. Consequently, modern fuel and energy companies should be reconstructed.

Our research based on conception «fuel and energy companies» as a cluster type combining fuel and energy complex, which includes companies with strong industrial and technological relations are in a particular area.

Combining structural integration make it possible to obtain greater economic benefits and reduce the environmental impact. Additional ecological and economic effect is achieved by the energy companies through a rational and complex processing of raw materials, waste reduction opportunities, joint treatment facilities and more. The economic, social and environmental effects of a business combinationshould be taken into account.

We use the value of ecological and economic damage to quantitative valuation of ecological influence caused by the activities of fuel and energy companies. Minimizing this value give us "environmental" effect of business combination.

Taking into account all factors for effective function of energy companies will identify a set of interrelated businesses so that technology and organizing process can be combined in the integration structures – «fuel and energy companies» – and have maximum economic, environmental and social effects.

NANOBIONIC PLANTS

M.Lisovenko, gr. PhE-21
N.I.Mulina,EL Advisor

Plants have many valuable functions: They provide food and fuel, release the oxygen that we breathe, and add beauty to our surroundings. Now, a team of MIT researchers wants to make plants even more useful by augmenting them with nanomaterials that could enhance their energy production and give them completely new functions, such as monitoring environmental pollutants.

The researchers report boosting plants' ability to capture light energy by 30 percent by embedding carbon nanotubes in the chloroplast, the plant organelle where photosynthesis takes place. Using another type of carbon nanotube, they also modified plants to detect the gas nitric oxide. Together, these represent the first steps in launching a scientific field the researchers have dubbed "plant nanobionics."

The idea for nanobionic plants grew out of a project to build self-repairing solar cells modeled on plant cells. As a next step, the researchers wanted to try enhancing the photosynthetic function of chloroplasts isolated from plants, for possible use in solar cells. Chloroplasts host all of the machinery needed for photosynthesis, which occurs in two stages. During the first stage, pigments such as chlorophyll absorb light, which excites electrons that flow through the thylakoid membranes of the chloroplast. The plant captures this electrical energy and uses it to power the second stage of photosynthesis — building sugars.

Chloroplasts can still perform these reactions when removed from plants, but after a few hours, they start to break down because light and oxygen damage the photosynthetic proteins. To design needed results are used different techniques including work on incorporating electronic nanomaterials, such as graphene, into plants.

Right now, almost no one is working in this emerging field. It's an opportunity for people from plant biology and the chemical engineering nanotechnology community to work together in an area that has a large potential.

FRESHWATER

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I. A. Morozova – E L Adviser

Most people don't actually think about the supply of water. Water is easy to ignore, you can just turn on a tap and water comes out!

We still have the same amount of water in our ecosystem but the supply of freshwater faces a three-pronged attack from population growth, climate change and industrialisation. As it currently stands, there's not enough water to go around. Of the World's total water supply 97% is seawater and of the remaining only 0.3% is usable unpolluted clean waterthat is readily available to us for our daily water supply.

Water is an important resource and wasting it could mean big shortages in the future. An average European uses 200 litres of water every day. North Americans use 400 litres.But this is the only part of the picture. When you consider the water required to produce all the stuff we consume, we actually guzzle a massive 4,645 litres every day.

If all brush teeth for 2 mins with tap on, we waste 12 litres of water. Baths uses 80 litres water, 5 min shower uses 35 litres, 5 min power shower uses over 60 litres. By washing their clothes everyday an individual takes 65 litres of water to fill a washing machine up.Most single flush toilets use around 9 litres per flush and an old style one can use up to 13 litres.And there are over 1,000,000,000 earthlings who still lack access to clean water.

But there are so many simple things we can do to save water. Turn the faucet/tap off while you are brushing your teeth, shaving, washing your hands, washing up dishes, and so on.Promptly repair any leaks in and around your taps. (One leak can waste several thousand litres of water per year.) Take showers rather than baths. By cutting one minute off your shower time, you can save about 3300 litres of water a year. Waiting until you have a full load for your dishwasher or washing machine can save up to 30 litres of water and use the shortest cycle possible.

СЕКЦІЯ 4 СТАЛИЙ ЕКОНОМІЧНИЙ РОЗВИТОК

REDUCE OF ADVERSE EFFECTS ON ENVIRONMENT IN CONDITIONS OF ECONOMIC GROWTH

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O.R. Gladchenko – EL Adviser

Economic growth, increasing of GDP may be accompanied by deterioration in the quality of life, including thanks to growth of the pollution level. This applies particularly to countries that are developing and structure of their manufacture is changing too slowly, while remaining enterprises are focused on the use of technology dangerous for the environment.

Economic growth, which leads to an increase in national wealth could cause the possibility of investment in green technology. But the possibility of economic growth also depends on motivation of business entities invest ecology on choice of their object and market conditions. Country at any level of development should give priority not to non-exhaustion of available resources, but the introduction of energy saving technologies, to save this development.

The government must create the motivation of business entities to invest money in introduction of environmentally safe technologies by environmental regulation. The methods of motivation include the introduction of harder environmental standards, the increase of energy prices and so on.

The object of the investment can be as cleaning equipment, recycling and technologies that will reduce the using of resources in production.

Accumulation of environmental problems is the limiting factor for economic growth. First of all, environmental degradation causes reduced quality of human capital. Also, pollution, depletion of natural resources has a negative impact on the volumes of agricultural and industrial production.

Thus, the analyzing all the facts mentioned before, it may be noted - that with the rapid economic and technological development of countries we must not forget about the state of our environment. We must put every effort to save it.

GREEN ECONOMY AS A SOLUTION OF ECOLOGICAL PROBLEMS

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Every year the world's GDP increases, but mainly due using of natural resources. Every year demand for environmental resources as water wood is increasing. Climate change, depletion of natural resources, increasing energy prices are some of the most important problems. The solution to these problems may be a shift to a "green economy." A new branch of economics called "green economy" is designed to improve the nature of the country. "Green Economy" - a new stage of development, which involves new technologies, ecosystems, the creation of "pure transport", organic food.

Green economy is an economy that enhances the welfare of people and provides social justice and thus significantly reduces the risks for the environment and depletion. Clean or "green" technologies are the heart of the green economy. Introduction of "green" economy depends on many factors, in the different countries this process will be different.

"Green" economy includes seven main areas:

The first direction - the introduction of renewable energy sources and preservation of minerals. Primary energy resources - oil and gas, but they are exhausted. And we need to solve the problem of their lack.

The second direction - energy efficiency in housing and communal services. Most apartment complexes are equipped with ineffective insulation constructions and heating systems, which leads to significant heat loss.

The third area - investment in environmental production. The increasing demand for environmentally friendly products can lead to the creation of new markets for businesses. The fourth area is improving the waste management system. During the last decade chemicals and waste management was one of the most important issues. Huge landfills, lack of control over garbage collection leads to contamination of the environment.

The fifth direction - improving the management of water resources. Water is a key component of ensuring the existence of a human and ecosystem. The rational use of water resources is a very important issue in "green economy".

Sixth direction - development of "clean" cars. High level of exhaust emissions of cars contributes to air pollution and the degradation of human health. It is expected that the energy needs of the world's transport annually will grow by 2% , and the level of energy consumption and greenhouse gas emissions by 2030 will increase by 80% comparing with 2010 levels .

The seventh direction is a conservation and effective management of ecosystems. Activity in this area is aimed at the preservation of the unique natural wealth of our country.

The idea of "green economy" has received positive reviews in many countries. UN agencies have announced a partnership in which 30 countries will receive support to develop national strategies for the development of a green economy. They will focus on creating new jobs, the introduction of cleaner technologies, reducing man-made risks.

Many countries supported the concept of "green economy", for example China , Costa Rica , Botswana, Brazil , Ethiopia , EU, Ghana, Indonesia, Japan, Kenya, Thailand, Nepal, Nigeria, Philippines, Russia , South Africa and the USA.

Almost all countries believe that the "green economy" is an important tool for achieving sustainable development. Developed countries made significant emphasis on the efficient use of resources, creation of new jobs. The result of a "green economy" must be the eradication of poverty and the achieving justice, attracting investment and increase opportunities for access to new markets. Now there is a need for new approaches to the management of the economy and ecology. Introduction of "green economy" will bring numerous benefits to help solve energy, economic, and environmental problems. This transition should be the basis for achieving sustainable development.

INVESTMENTS

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Investments are all types of property and intellectual values, invested in business and other activities, created as a result income or achieve social impact.

These values can be:

- Funds, special bank deposits, shares, stocks and other securities;
- Movable and immovable property (buildings, equipment and other tangible assets);
- Intellectual property rights;
- The right to use a land, water resources, buildings, equipment and other property rights;
- Other values.

There are vast possibilities that can be used by businessmen investing in Ukraine. Our country is famous for its natural resources, such as mineral deposits and other sources of energy. The mild climate and fertile soils makes Ukraine attractive for agricultural production. Its geographical position allows international trading with the majority of countries of the world. Ukraine has such branches of industry as metallurgy, machine-buildings, power industry and chemical industry.

Unfortunately, Ukraine, like other countries originating from the former Soviet Union, is associated with corruption, bribery and other obstacles encountering investors on their way. Political and economic instability also has a negative influence on the attractiveness of Ukraine. At the same time recent amendments to investment rules have shown that the Ukrainian legislator recognizes the need to adjust them to the real situation in order to improve the investment climate.

Therefore, despite the existing drawbacks and considering the abundance of the advantages for investments, Ukraine may be rather attractive for those foreign businessmen wishing to invest in the Ukrainian economy.

OPTIMIZATION OF FINANCIAL PROVIDING OF ENTERPRISES' INNOVATION ACTIVITY

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S.G. Zolotova – EL Adviser

The recent financial instability in Ukraine and modern global tendencies in world economy have caused the necessity to find new financial recourses for innovation and investment activity of every competitive enterprise. Furthermore, the possibilities of self-financing and attraction of budgetary means, internal and external investments, banking credits, venture capital etc. are limited. This process is not only problematic, but expensive, risky and demanding highly experienced personnel. Besides it, every enterprise wants to receive maximum profit on the assumption of minimum costs. Thus the necessity to optimize the financial providing of enterprises' innovation activity is obvious, and chosen direction of scientific research is topical enough.

It should be said, that optimization methods in finance, linear and nonlinear programming, innovative management are research objects of many scientists, such as: V. Aleksandrova, F. Anderson, I. Balabanov, F. Black, I. Blank, S. Brown, T. Coleman, I. Fisher, R. Fletcher, V. Geets, G. Goldshtein, S. Leyffer, H. Markowitz, M. Miller, W. Sharpe etc. However, scientific and methodical approaches of optimization of financial capital structure require further development and improvement taking into account the peculiarities of national innovative enterprises' activity and global calls.

Modern finance has become increasingly technical, requiring the use of sophisticated mathematical tools in both research and practice. Many find the roots of this trend in the portfolio selection models and methods described by Markowitz in the 1950's and the option pricing formulas developed by Black, Scholes, and Merton in the late 1960's. For the enormous effect these works produced on modern financial practice, Markowitz was awarded the Nobel Prize in Economics in 1990, while Scholes and Merton won the Nobel Prize in Economics in 1997.

Obviously optimization models play an increasingly important role in management and financial decisions. Optimization techniques can serve as one of the tools for any financial institutions and companies to find better solutions and improve decision-making. Thus many computational finance problems ranging from asset allocation to risk management, from option pricing to model calibration can be solved efficiently using modern optimization methods including linear, quadratic, integer, dynamic, stochastic, conic, and robust programming etc.

In general optimization is a branch of applied mathematics that derives its importance both from the wide variety of its applications and from the availability of efficient algorithms. Mathematically, it refers to the minimization (or maximization) of a given objective function of several decision variables that satisfy functional constraints. In our research the optimization model of financial providing of enterprises' innovation activity addresses the allocation of scarce resources among possible alternative uses in order to maximize an objective function such as total profit. In such case the objective function, decision variables and constraints are three essential elements. The investigation involves building models, working out the implications or predictions and testing whether they fit with the facts.

Therefore the optimization of financial providing of enterprises' innovation activity is topical research field with significant contributions and important practical applications because of continual stream of challenging problems with obvious impact of uncertainty, high availability of data, competitive markets, risky and limited capital of enterprise etc.

FINANCIAL MANAGEMENT OF FIRM'S INNOVATION ACTIVITY

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S.G. Zolotova – EL Adviser

In modern informational society and dynamic business environment innovation is the only factor which can sustain long-run growth of certain country under the influence of global development gap, rapidly changing customer needs, high level of market competition. Besides it not only governments but more and more firms are realizing the importance of innovation to gain competitive advantage. Obviously, they are engaging themselves in various innovative activities, ranging from manufacturing processes, product improvement, and brand building initiatives. Firms are creating new products, solutions and services that provide a radically better experience for the consumers.

Although innovation can help to discover what opportunities exist now, or are likely to emerge in the future. Successful businesses not only respond to their current customer or organizational needs, but often anticipate future trends and develop an idea, product or service that allows them to meet this future demand rapidly and effectively. Thus the build-up of innovation capacities has played a central role in the growth dynamics of successful developing countries.

However, companies aiming to increase their innovation levels need to improve the management of a number of areas, including the generation of ideas and their quick implementation. But the most important is financial management, because without strong financial management, innovation might come to a dead stop, never happen or just cost much more than it should. Therefore the question of financial management of firm's innovation activity is topical and requires further development.

It should be said that efficiency of innovative activity depends foremost on efficiency of management. One of obvious problems in this context is limited nature of the financial providing. In fact, lack of financial resources is one of the big obstacles to

innovation. Besides it innovation activity is risky and has specific characteristics that have implications for finances: more uncertainty about return on investment and about the level of investments required, especially in the early stages of innovation, makes it more difficult to convince management to invest in new ideas.

Moreover finding new financial resources is only part of financial management. A firm needs to make sure to capture the right funding for the right projects and have the right financial mix for innovation and investment portfolio. Therefore effective functioning of financial management of firm's innovation activity must be provided by corresponding mechanism of financing of firm's innovative activity.

To our mind, the mechanism of financing of firm's innovative activity is a complex of methods and instruments of the financial providing of innovative process included own, attracted resources and firm's potential, and also legislative base, organizational and informative providing of firm's innovative activity.

The main methods include planning and prognostication, financial analysis, SWOT-analysis, normative and balancing methods, estimation of project efficiency and risk, capital rating, controlling, audit, monitoring, outsourcing, studies of personnel and managers etc. The estimation of efficiency of financial management is realized on the base of different indicators: net present value (NPV), wage average cost of capital (WACC), norm of profitability, term of recoupment, optimality of capital and organizational structure, risk level, timeliness, flexibility, achievement of aims and planned indexes and other like that.

EDUCATIONAL SERVICES IN SUSTAINABLE DEVELOPMENT

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The essential condition for the economic sustainable development is the high level of education of human resources. It is the reason for topicalization of the higher education quality theme in the scientific literature.

Higher education is the part of the social sphere with various peculiarities: providing a benefit in a form of service, usage of a benefit has outer effects; usage of the value approach to activity evaluation.

The absence of quantitative evaluation of the social sphere directions performance used to be explained by the inability of its determining for a long time, but today scientists who study economics of education consider that the reason is a poor development of the tools of such evaluation.

The difficulty of tools development consists in a number of specific features as follows:

- absence of the material form (materialized educational service is an educational subject of sale);
- integral nature of subject and object (the service is available only in the process of subject activity and requires the active participation of the object);
- the service rendering takes a considerable amount of time (at least four years);
- a consumer of the service must meet the list of characteristics (a complete secondary education, appropriate level of knowledge and skills, health status etc.);
- necessity of the public control even in market conditions (education quality determines social development);
- non-equivalence of the service and result of its consumption.

Let us go into particulars of the latter feature, since it hardly

occurs among the typical characteristics of the educational services.

This feature was first observed by the Russian researcher S. Belyakov. He understands the non-equivalence of the service as a discrepancy of capital paid by the state or a student to the received results that is finally not determined by higher education institutions.

In contemporary research of the economics of education two approaches to the determining of educational activity outcomes are distinguished:

- the result of receiving education is a person's skills that are renewed or increased by this person in the process of training, which subsequently allows her or him to earn more ("human capital theory");

- the result is the degree of knowledge transfer from a teacher to students, i.e. the subject of the evaluation should be the teacher's abilities demonstrated during a training process.

Let us try to determine, what is really received by the consumers. The process of education service looks rather typical and consists in ordinary exchange of goods or buy and sell process: the service is transferred from a producer to a consumer. A producer gets the revenue. For a certain sum of money a consumer gets a soft benefit that is helpful for him. However in this situation we have some questions: what is the subject of buy and sell process, what is the nature of the equivalence, and what is the result of this process? The answer "education service" is very general.

In the reality the subject is the certain result that must be reflected in benefits obtained by the consumer from the received soft benefit. Unfortunately, this benefit is very difficult to determine. A successful employment and the wage relevant for the received education and specialization must be the result indicator for a consumer.

For the education service evaluation it is necessary to take into account this very factor as one of the most essential for the determining of education institutions service rendering quality.

SUSTAINABLE ECONOMIC DEVELOPMENT

Ihor Maksymeno - Sumy State University, Group M-32.
Ph. D. N.V. Malovana

The domain of 'economics' is fundamental to considerations of sustainable development, however there has been considerable criticism of the tendency to use the three-domain model of the triple bottom line: economics, environment and social. This approach is challenged to the extent that it treats the economy as the master domain, or as a domain that exists outside of the social; it treats the environment as a world of natural metrics; and it treats the social as a miscellaneous collection of extra things that do not fit into the economic or environmental domains (see the section on Economic sustainability below). In the alternative Circles of Sustainability approach, the economic domain is defined as the practices and meanings associated with the production, use, and management of resources, where the concept of ‘resources’ is used in the broadest sense of that word.

Economic development has traditionally required a growth in the gross domestic product. This model of unlimited personal and GDP growth may be over. Sustainable development may involve improvements in the quality of life for many but, particularly for the affluent, may necessitate a decrease in resource consumption.

Sustainability is measured in a macroeconomic context covering: physical indicators of sustainability; resource and environmental accounting; savings and the empirical measurement of sustainable development; international trade and unsustainable development; ecological indicators; income distribution and social needs; and the assessment of structural adjustment policies and their implications for sustainable development.

THE MAIN REASONS OF USING ENVIRONMENTAL TAXES

T.V.Volkovets – postgraduate student, Sumy State University, S, Zolotova – EL adviser

The objectives of environmental policy can be reached by using different methods and instruments. Most of them can be divided into two main groups: economic instruments and administrative instruments (frequently called “command and control” (CAC) regulation). In spite of the fact that combining CAC regulation with economic instruments can provide a higher efficiency of environmental measures, it is often argued that one of these groups is more worth using than another. It would be better to say that there are some cases when CAC regulation is more appropriate and some cases when using economic instruments provides better results. It is connected with peculiarities of these instruments.

As environmental taxes are one of the most popular economic instruments of environmental policy, let’s analyze what benefits can they provide and what are the crucial factors of their efficiency.

The main reasons for increasing use of environmental taxes are as follows:

- internalization of externalities: environmental taxes try to reflect the cost of environmental damage by increasing the price of a good or activity;
- incentive to abate: reducing of environmental tax payments can be reached by decreasing of the tax base (i.e. decreasing the amount of pollution). In such way environmental taxes provide an incentive for abatement activities;
- incentive to innovate: decrease in the amount of pollution can be provided by improving the technological process of producing goods by developing and implementing innovations;
- flexibility in determining the least-cost way to reduce the environmental damage (thus to reduce environmental tax payments): environmental tax allows each polluter to decide whether its cheaper to pay the tax or to reduce pollution [1, 2];
- raising revenue: environmental taxes revenue can be used to address environmental problems directly or to finance other government purposes.

All of these effects of using environmental taxes can be achieved only if tax implementation is well-designed. A number of factors should be considered while designing and implementing environmental taxes:

- environmental tax should be levied as directly as possible on the pollutant or action causing the environmental damage [2];

- an environmental tax should be designed according to the scope of environmental damage: for instance, water pollution effects can be spread over a few regions, that is why environmental tax on water pollution has to be implemented on the national level;

- it is better when environmental taxes have no exceptions at all (that reduces the probability of tax evasion). Nevertheless, exceptions can help to consider impact of such taxes on some taxpayers, e.g. low-income groups, that is why they are still important, but they should be few to avoid rising of administrative costs and decreasing of environmental taxation incentive effects;

- tax rate should correspond to the value of the environmental damage (according to Arthur Pigou environmental tax rate is optimal when marginal private costs are equal to marginal social costs which reflect society's value of the environmental damage);

- predictability of tax rate is a significant factor of motivating environmental improvements: when taxpayers know about soon rising of tax rate they have a possibility to prepare for it: they have enough time to improve the production process by implementing technological innovations or by substituting some resources which will be taxed at higher rates, etc.

So, every instrument has its advantages and limitations, otherwise it would be no need in plenty of other instruments. That is why knowledge about advantages and limitations of different economic and CAC instruments gives a possibility to combine them successfully.

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RENTENVERSICHERUNG IN DEUTSCHLAND

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Egal, wie alt Sie sind, die Frage der materiellen Sicherheit im Alter – eine der wichtigsten Fragen für jede Person.

In Deutschland gibt es ein Paradox, dass die Menschen, die das ganze Leben gearbeitet und erhalten 2500 € haben, werden in den Ruhestand nicht über 650 € bekommen.

Das Problem der Rentenversicherung stammt aus der Zeit von Reichskanzler Otto von Bismarck. Deutschland war das erste Land der Welt, das nationale Sozialversicherungssystem einzuführen. Das Grundprinzip des Systems hat in der Tatsache gelegen, dass die Arbeitsleute die Rentner enthalten. Und sie rechnen einen bestimmten Prozentsatz ihrer Monatsgehälter auf die staatlichen Rentenfonds ab.

Die Situation hat sich in dem letzten Jahrhundert verändert. Deutschland hat mit wirtschaftlichen und demographischen Problem getroffen. Es gibt mehr Arbeitslose, die können nicht die Lasten in dem Pensionsfonds machen.

Das moderne Rentensystem in Deutschland besteht aus drei Hauptstufen: 1) die Rentenpflichtversicherung; 2) die Pensionsversicherungsgesellschaften; 3) die private Rentenversicherung.

Die private Rentenversicherung gibt die soziale Sicherheit mehr als ist in dem Pflichtversicherung vorgeschrieben. Es ist eine alternative Form der Versicherung für Personen, die nicht der obligatorischen Rentenversicherung bekommen.

Um die solche Rente zu bekommen, muss man mit einem privaten Versicherungsunternehmen ein individueller Vertrag Rentenversicherung folgern. Die Beiträge zu privaten Versicherungen sind viel höher aber die Rente wird auch höher.

Das Sprichwort sagt, um im Alter gut zu leben, muss man in der jungen Zeit denken.

LOGISTICAL AND MARKETING FACTORS IN PACKAGINGDECISIONS

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Every company trying to get the place for its product on the market, plans to receive as many orders and customers as possible. However, the products are not always adequately accepted by the market. Product promotion on the market is possible only when the product satisfies the needs of the customers and its quality meets the market expectations. If it does not, then the product loses its appeal to buyers rapidly and then leaves the market. To prevent this situations, it is very important to use all features of a product including the packaging.

Marketing pays much attention to the packaging. Packaging, its quality and its functions aimed basically at the market promotion are very important for the success.

Packaging also has a big effect on the logistics efficiency, where the qualitative improvements could be reached by the development of the "logistical packaging" concept. On the one hand, packaging plays an important role in protecting a product quality, but on the other hand, it should also increase the interest among buyers. The simultaneous achievement of these two objectives is a quite complicated task.

Packaging is an important and essential attribute of a product in the modern world. It is a container or a product wrapper [1, 2, 3, 10].

In the modern world, packaging creates an additional value for a customer by providing the following benefits:

- Informational – it gives a required product details.

- Functional – it helps to ensure the consistency, security and the safety of a product, guarantees a comfortable usage of a product.
- Perception benefits – it provides a positive perception with the help of a bright design proposal, which is easy to remember.

There are the following factors that influence the type of packaging in a practice:

- properties and characteristics of the goods, weight and volumes during transportation, loading and storage;
- level of adaptability to the transportation, storing;
- types of goods and means of transport, as there are significant differences in the package, depending on the vehicle.

The choice of packaging manufacturer is affected by many factors. Basic factors influencing the choice of packaging are listed below:

- packaging design should match the image which the company wants to create for their products and marketing strategies
- collective package should be adequate to make the group (one item on each package of a certain range, or a variety of packages for different segments of the market)
- the standardization of packaging caused the desire for international products recognition
- the cost of the package must meet the consumer's needs
- the choice of materials for packaging (cardboard, plastic, metal, glass, etc.) is dictated by the transportation, storage products, manufacturing traditions
- multi-various packing is determined by the possibilities of a company, the requirements of distribution channels, customer needs
- printing prices in advance is based basically on the wishes of dealers

- competitive advantages may create individually packed portions

The desire of designers to create an original and complicated packaging, which is often prompted by the requirements of the marketing, may lead to the unplanned increasing of logistical costs of physical distribution.

Marketing sometimes defines a packaging term as an “silent seller” concept because on the retail stage it may become the decisive factor affecting sales greatly. From the position of marketing the following parts are important for the product: the appearance of packaging, its colorfulness, the presence of complete information about this product – i.e. a list of features, that can distinguish a product among similar interchangeable goods from the different competitor offers.

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BUDGET DEFICIT IN UKRAINE: PROBLEMS AND WAYS TO IMPROVE

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A budget is essential for any organization if it wants to face its financial obligations. Facing these financial obligations is especially difficult for governments that have to manage billions of dollars of revenue and expenditures every year. When the government expenditure exceeds revenues over a particular period of time, the government is having a budget deficit.

In Ukrainian practice there are two groups of reasons for budgetary deficit: objective and subjective. A group of objective reasons includes:

- extraordinary circumstances (epidemics, wars, natural disasters, etc);
- the state's major investments in the development of the economy,;
- increasing the population income level, if its value does not correspond to the subsistence level.

Subjective reasons are:

- the economic crisis;
- considerable share of the shadow sector of the economy and, accordingly, low tax discipline;
- irrational structure of state budget expenditures and inefficient using of budgetary funds at all levels;
- significant costs to maintain government officials;
- imperfection, lack of coordination and frequent changes of the financial legislation;
- the lack of clear financial strategy.

Back in the 30s, Swedish economists, Myrdal and B. Ulin claimed that some excess of expenses over income is needed to stimulate economic growth, especially in times of crisis. And according to J. Keynes state budget deficit has become one of the

ways of regulation of the economy. So, what are the answers: is budget deficit good or bad?

Whether government deficits are good or bad cannot be decided without examining the specifics. On one hand, if the government borrows (runs a deficit) to deal with a severe recession (or depression), to help self-defense, or spends on public investment (in infrastructure, education, basic research, or public health), the majority of economists would agree that the deficit is bearable, beneficial, and even necessary. If, on the other hand, the deficit finances wasteful expenditure or current consumption, most would recommend tax cuts to stimulate private investment, transfer cuts, and/or cuts in government purchases to balance the budget.is running a deficit, it is spending more than it's receipts.

Therefore, we propose next solutions.

1) to improve the tax system;

2) to strengthen the responsibility of economic entities;

3) to provide financial support to small and medium-sized businesses by development and implementation of target programs for development of small and medium enterprises;

4) to introduce a strict regime of economy of budgetary funds;

5) to introduce a new, scientifically grounded system of forecasting indicators values, which are used as the basis for the formation of budget revenues and expenditures, budget planning norms of budget sufficiency;

6) to change the directions of public funds investment in the industry national economy;

8) to keep financing only the most important social programs and introduce a moratorium for the adoption of new social programs, which require substantial budgetary financing;

9) to prohibit the National Bank of the country to provide loans to the governmental structures of any level;

Consequently, budget deficit is a controlled phenomenon. It should be eliminated or reduced. Ukraine should define a clear financial strategy. Perhaps, it is essential to study and to attract foreign experience in order to bring the economy to a new level.

SUSTAINABLE ECONOMIC DEVELOPMENT

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Today. I would like to write you about economic development. To my mind, economic development refers to the sustained, concerted actions of communities and policymakers that improve the standard of living and economic health of a specific locality. Also, development of the economic system is a profound qualitative change in its composition, relationships and function. Economic development involves development of human capital, increasing the literacy ratio, improve important infrastructure, improvement of health and safety and others areas that aims at increasing the general welfare of the citizens.

If we take the situation in Ukraine, I can say that Ukraine experiences problems connected with institutional framework development which cause political and economic instability. Economic development will only be successful if the whole nation is willing to give their best efforts towards its achievement.

Economic approach to the concept of sustainability is based on the theory of maximum flow total income Hicks - Lindahl , which can be made subject to save the total capital , with which it is performed and revenue . This concept implies the optimal use of scarce resources and the use of sustainable - Nature -, energy - and material- saving technologies , including extraction and processing of raw materials , creation of environmentally friendly products , minimization , recycling and disposal. Economic growth is one of the main macroeconomic objectives of any country, which is caused by the need to achieve accelerated growth of national income compared to the population growth to improve living standards in the country.

The set of factors of economic development covers the basic natural factors that make up its foundation, and a variety of tools and forms created by humanity in the course of evolution. Owing to their optimum interaction entire regions of the country and achieve impressive results in economic development. Conversely, fault of mechanisms that combine natural and acquired factors of economic development, causing serious economic crisis and complexity of the processes that periodically erupt in different sectors of the global economy.

SUSTAINABLE ECONOMIC DEVELOPMENT

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Sustainable development is an organizing principle for human life on a finite planet. It posits a desirable future state for human societies in which living conditions and resource-use meet human needs without undermining the sustainability of natural systems and the environment, so that future generations may also have their needs met.

For cities/regions to prosper and be successful in the 21st Century, their economic development strategies must engage with the economic opportunities offered by the sustainability revolution.

How this can be accomplished is the message of this paper, which is addressed to the audiences of:

- Regional, state, county, and city public officials.
-Economic development agencies.
- Environmental, energy, waste management, and other sustainability agencies.
- Community and neighborhood development organizations.
- Technology development agencies.

A Sustainable Economic Development strategy uses all of these best practices in a modified fashion

to encourage:

- Businesses that specialize in environmental products and services (the cleantech business cluster) to start-up, locate, and grow in the region.
-All businesses in a region to become greener and, at the same time, more economically productive.
-Sustainable real estate development to take place—development that is mixed use, mixed income, walkable, energy and resource efficient, and transit oriented.
- The regional financial, workforce, and educational infrastructure to understand sustainable enterprises, in order to encourage investment in the sustainable economy and to prepare people to participate effectively as workers, consumers, and investors.

- The regional physical infrastructure to provide energy, water, materials, buildings, and mobility in a way that is both ecologically and economically efficient.

-The region to be recognized as a place that is in the forefront of the sustainability revolution, becoming an economically, socially, and environmentally better place to live, work, and locate a business.

A Sustainable Economic Development Strategy provides guideposts on the way to the full realization of the promise of the sustainability revolution. As such, it can help create a place that the residents will be proud to hand on to their children and their children's children.

SUSTAINABLE ECONOMIC DEVELOPMENT

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There are many definitions of sustainable development, including this landmark one which first appeared in 1987: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."— from the World Commission on Environment and Development's (the Brundtland Commission) report Our Common Future (Oxford: Oxford University Press, 1987).

Increasingly, "green," "sustainable," or "low-carbon" development is seen as a pathway to economic recovery, resilience, and prosperity. A growing number of cities and regions are recognizing that their climate, energy, and economic development goals and agendas are parts of the same whole. The interest in sustainable economic development and the "clean economy" has gained increasing attention in recent years.

Sustainable development ties together concern for the carrying capacity of natural systems with the social and economic challenges faced by humanity. Research in this area tackles the issue of how to improve our economy and our environment at the same time, with a particular focus on creating employment and preserving well-paying jobs. Sustainable development may involve improvements in the quality of life for many but, particularly for the affluent, may necessitate a decrease in resource consumption.

СЕКЦІЯ 5 ЗДОРОВИЙ СПОСІБ ЖИТТЯ

RISK ASSESSMENT OF NON-CARCINOGENIC EFFECTS OF AMBIENT AIR POLLUTION IN DONETSK REGION

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O.R. Gladchenko – EL Adviser

The methodology of risk is actively developing in Ukraine nowadays. The risk of contaminant exposure of species is defined as the probability of a person to have any adverse effect as a result of the impact. The concept of environmental risk can provide a quantitative description of the environmental hazards of a wide class of phenomena and processes. This quality of risk assessment is interesting for environmental monitoring. A comparative analysis of risk assessment was made in selected settlements in Donetsk region, in Donetsk, Yenakievo, GorlivkaMakiyivka, Mariupol, Thorez, Slaviansk and Artemovsk. This risk assessment is connected with the health of population and non-carcinogenic effects of air pollution.

We calculated: the individual not carcinogenic (systemic toxicity) risk; annual not carcinogenic risk (the amount of toxic effects), risk characterization of carcinogenic effects when nitrogen dioxide and undifferentiated dust enter simultaneously during inhalation.

The purpose of this report to give the definition of the development of no carcinogenic effects on human health of associated with air pollution in the residential areas of Donetsk region. To analyze the relationship of environmental risk of carcinogenic activity and health status the rates of aging population in the cities were calculated. To calculate the environmental risk we used two methods: was used in the Kurolap`s study and the second is "Guidance on the assessment of environmental risk when exposed to chemicals that pollute the environment".

According to the data calculated by the method of Kurolap in the Donetsk region the highest level of risk of nitrogen dioxide and dust air pollution was observed in Mariupole. Then go Makeevka, Donetsk, Gorlivka, Yenakievo. The relatively low level of risk is

observed in such cities as Donetsk, Slovyansk, Thorez. According to the methods of risk assessment we can say that if the values of the calculated risks do not exceed one point, the chances of having a harmful effect on human life are not essential and this effect is characterized as acceptable.

The data showed that the levels of risk development of such non carcinogenic effects on the health of the population in the cities in ambient air pollution were valid.

Then the tempo of population aging was calculated. 320 people took part in the survey. Among them there were 80 men aged 35-60, 80 women aged 34-60 and 160 teenagers aged 15-21. We calculated the biological age and the real biological age and the difference between them was estimated using classers of aging from one to five. Thus, I class corresponds the very slow tempo of aging, and V very accelerated tempo, III class characterizes the approximate correspondence of biological age and calendar. People assigned to classes IV and V in terms of aging, should be included in the risk group for their health status.

According to a study we came to the conclusion that men of all settlements are more likely to accelerate and dramatically accelerate the tempo of aging. If you compare boys and girls, the boys are more likely to the accelerated tempo of aging.

Since the concentrations of pollutants in the environment in the studied area do not exceed health standards, the cases of acute toxicity aren`t observed. Variations in health status are associated mainly with chronic effect on the organism thanks to low concentrations of pollutants. As a result we found definite relationship between the rate of population aging and the development of risk assessment of non-carcinogenic effects of two pollutants: nitrogen dioxide and dust. There is an evidence of overlap between the risk group with the accelerated tempo of aging and the environmental risks. The exception is city Yenakievo.

When harmful substances are inhaled in a human body this dramatically influences aging and human health.

STUDY AT TWINS' CONVENTION HELPS CLARIFY HOW SMOKING AFFECTS FACIAL AGING

O.Artyshchuk. – Sumy State University, group PS-301
N.O. Simonenko – EL Adviser

We all know that smoking is bad influence on human health. Smoking causes many diseases and premature aging. This is best seen in the twins. Study at Twins' Convention Helps Clarify How Smoking Affects Facial Aging. Taking advantage of the annual Twin Days Festival, held in Twinsburg, Ohio, the researchers identified pairs of identical twins who differed by smoking history. In each pair, either one twin smoked and the other did not, or one twin smoked at least five years longer. Scores on several measures of facial aging were significantly worse for the smokers. The smokers had more sagging of the upper eyelids, as well as more bags of the lower eyelids and under the eyes. Twins who smoked also had higher scores for facial wrinkles, including more pronounced nasolabial folds, wrinkling of the upper and lower lips and sagging jowls. Twins with a longer duration of smoking had worse scores for bags on the lower lids and under the eyes and lower lip wrinkles.

You know smoking doesn't do any favors for your face – or your lungs, or your heart, or just about any other part of your body, for that matter! – but a new study of twins hints at the ways the habit makes you look older than you really are. But if you're currently a smoker, the point of this research is not to make you feel bad. Because stopping or cutting back on the habit now can make a difference -- in all aspects of your health, including the skin damage to your face.

Here's something to think about the next time you put a cigarette to your lips: The skin around those lips is going to look older. You're also more likely to get bags under your eyes sooner. And jowls. And more wrinkles around those lips. Smoking reduces the collagen formation, results in collagen degradation and reduces the skin circulation. Additionally, nicotine reduces the skin thickness. All of these reduce skin elasticity and premature aging. When you stop smoking its starts to repair yourself. If you want save your skin better you must use facial creams or plastic surgery.

NO KNIFE OPERATIONS: THE NEXT GENERATION OF SURGERIES

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If I asked you to think of the riskiest, most serious surgery you can imagine, there's a good chance the operation that first came to mind would fall into one of two categories: heart surgery or brain surgery. When these oragans are damaged by an injury or disease, the effects may be severe – and the implications of performing surgery on these organs can be grave.

Medical breakthroughs are allowing doctors to treat conditions that once required risky surgeries with non-surgical procedures. From catheters to ultrasound beams, these new devices and techniques make real impacts on patients.

For skeptics, surgery without knives probably sounds circumspect. At best, it sounds like a concept pulled from a work of science fiction. Sure, robotic surgeries once seen only in movies are now part of real-life hospital settings, but even at the onset, that idea seemed less far-fetched than surgery without knives.

In knifeless operations, surgeons swap their traditional cutting tools for beams and waves. Focused ultrasounds and radiation beams eliminate tumors and cysts in ways that seem magical, but it's all based in science. These techniques and devices are helping patients around the world survive cancer, end life-altering disorders, and preserve body parts that would be harmed or removed if treated with traditional surgery.

Ultrasounds

Ultrasounds have long been used to view the inside of the body. Doctors use them regularly to produce images of unborn babies throughout the mother's pregnancy as well as to diagnose medical conditions. In recent years, it has even become common to use ultrasounds to guide needles for biopsies and surgical anesthesia.

Radiosurgery

Like ultrasound surgery, radiosurgery is non-invasive. It delivers beams of radiation precisely to the desired location, so that

cancer patients get all the benefits that traditional radiation treatments have on tumors without the side effect of extensive damage to healthy cells. Although each beam causes no damage to the tissue en route, when they all meet at the target, the resulting dose destroys the tumour.

Heart to Heart: Swapping Invasive Operations for Catheters and Tubes

While no one likes the sound of invasive tubing, the minimal amount of discomfort of having a small tube inserted into the arm or leg surely beats the prospect of having your chest sliced open, your breast bone sawed apart, your rib cage opened, and your heart literally stopped.

Researchers are even investigating the use of catheter-based "surgeries" to treat high blood pressure, a prevalent disorder across the globe that boosts patients' risk of suffering heart attacks. Think about that idea for a second.

The Future of Surgery

The process of recovering from knifeless surgical procedures can greatly benefit patients. When individuals are confined to a bed for long periods of time – even a few weeks – the body undergoes changes that are not easily reversed. As new, game-changing technologies like focused ultrasound surgeries, heart-repairing catheters, and radiosurgical devices continue to emerge and their uses continue to grow, will we ever see the day when surgeons lay down their scalpels completely?

I hope that someday, all cancers can be treated with this type of precision and thoroughly eliminated without causing undue, and sometimes insurmountable, damage to the rest of the patient's body. Imagine the implications that these knifeless operations have for patients who are forced to undergo emergency surgery like those in the midst of suffering cardiac arrest. For trauma patients, no-knife surgeries could allow doctors to stabilize patients more quickly and without adding further stress to already broken bodies. The technology of knifeless surgeries has the potential to change healthcare as we know it, lengthen lives, ease pain, and give patients the precious gift of time.

COMPLEMENTARY AND ALTERNATIVE MEDICINE

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We have all heard the terms “complementary medicine” and “alternative medicine” on the TV or somewhere else, but what do they really mean?lternative medicine is a collective name for methods pretending on the ability to treat (or prevent) disease. There are five major categories of complementary and alternative medicine therapies.

1. WHOLE MEDICAL SYSTEMS

Alternative medical systems are built upon complete systems of theory and practice.

Systems are not just a single practice or remedy but many practices that center on a philosophy, such as the power of nature or the presence of energy in your body. There are examples of the whole medical systems: ancient healing systems arose long before conventional Western medicine and include ayurveda from India and traditional Chinese medicine; homeopathy based on Samuel Hahnemann`s doctrine of `like cures like`, according to which a substance that causes the symptoms of a disease in healthy people will cure similar symptoms in sick people; naturopathy focuses on noninvasive treatments to help your body do its own healing and uses a variety of practices, such as massage, acupuncture, herbal remedies, exercise and lifestyle counseling and generally avoids the use of surgery and drugs.

2. MIND-BODY MEDICINE

Mind-body techniques strengthen the interaction between your mind and your body. These two systems must be in harmony for you to stay healthy. Examples of mind-body connection techniques are meditation, prayer, relaxation and art therapies.

3. BIOLOGICALLY BASED PRACTICES

Biologically based therapies use botanicals, animal-derived extracts, vitamins, minerals, fatty acids, amino acids, proteins, prebiotics and probiotics, whole diets, and functional foods.

4. MANIPULATIVE AND BODY-BASED METHODS

These methods use human touch to move or manipulate a specific part of your body. They include chiropractic and osteopathic manipulation and massage. Manipulative and Body-Based Therapies can treat: accident and sports injury, anxiety and stress, arthritis, asthma, chronic fatigue syndrome, fibromyalgia, headache, infertility, low back pain, migraines, neck pain/shoulder pain, overuse or misuse of the body, sinusitis, visual problems.

5. ENERGY MEDICINE

Some complementary and alternative medicine practitioners believe an invisible energy force flows through your body, and when this energy flow is blocked or unbalanced you can become sick.The goal of these therapies is to unblock or re-balance your energy force..

So, in conclusion we can say that people often turn to CAM when they have a long-lasting problem that conventional medicine hasn't completely cured.

Trying practices like meditation and breathing can't do any harm, but other CAM techniques may have consequences for people with certain health conditions. Even the more mainstream practices like yoga can hurt someone with a health. So check with your doctor before trying any CAM techniques.

ТЕЛЕМЕДИЦИНА

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Телемедицина – напрямок, що використовує телекомунікаційні й електронні інформаційні технології для надання медичної допомоги та обміну медичною інформацією між фахівцями з метою підвищення якості діагностики та лікування. Саме за вдяки цьому напрямку з'являється можливість надання необхідної медичної допомоги людині, незалежно від її місцезнаходження, що часто є актуальнім. Ця проблема є надзвичайно актуальною для України, оскільки невідкладне медичне консультування нерідко вкрай необхідне.

В даній роботі розглядаються основні завдання телемедицини:

- профілактичне обслуговування населення;
- зниження вартості медичних послуг;
- обслуговування віддалених суб'єктів;
- підвищення рівня обслуговування.

Великим досягненням телемедицини можна вважати те, що вона знімає питання ізольованості лікарів з віддалених невеликих населених пунктів. Завдяки їй лікарі можуть в процесі консультації отримувати нові знання, досвід,відвідувати відеолекції, спостерігати за ходом операції досвідчених фахівців.

Основні переваги: скорочення термінів і підвищення якості діагностики, зменшення числа випадків ускладнень захворювань, наближення сучасних методів діагностики і лікування до широких верств населення; соціальна ефективність, забезпечення одного з найважливіших конституційних прав громадян - на доступну кваліфіковану медичну допомогу; економічна ефективність.

Таким чином телемедицина відіграє значну роль внадзвичайних станах, пов'язаних з природними і техногенними катастрофами, стихійними лихами тощо.

THE PLACE OF BCG-OSTEITIS WITHIN DISEASES OF BONE SYSTEM IN CHILDREN OF PRESCHOOL AGE

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Introduction. The epidemiological situation of tuberculosis in Ukraine does not tend to improve.

Background. In Europe extra pulmonary tuberculosis is 97% and in Ukraine - 3%. But affection of the bones among children of preschool age began to increase. This generates some diagnostic difficulties.

The goal of the work is to share research with pediatricians, pediatric surgeons and orthopedists with features of tuberculosisosteitis and its diagnosis in preschool age groups.

Materials and methods. The article presents the analysis, diagnosis and treatment of 67 children under 6 years.

Results. Tuberculosis etiology was observed in 30 (44.8%) children. The vast majority of tuberculousosteitis was diagnosed at age of 3 in 83.3% cases, lesion of the femur was observed in most cases - in 12 (40%).

Keywords: osteomyelitis in children, BCG-osteitis.

Introduction. The epidemiological situation with tuberculosis around the world every year becomes worse [1, 2, 3, 4, 5, 6, 7, 9, 10]. Every year 8-10 million new cases are being diagnosed. More than 3 million patients die [3]. Ukraine has reached a certain stabilization of the infectious disease [2, 3, 4]. In our country in general the rate of extrapulmonary forms of tuberculosis is 3 % [3, 5, 6]. In 40-45 % of cases the osteoarticular processes are observed[5]. It is believed that

osteoarticular tuberculosis has a tendency to increase in numbers. [4, 5].

Recently the cases of tuberculous lesions of skeleton apparatus have started to occur in young children [2, 3, 4, 6, 7, 8]. Osteitis, which can be associated with vaccination against tuberculosis is disclosed in 75 % of these patients [3, 7, 9]. Though the first case of BCG osteomyelitis was described over 40 years ago phthisiatricians and immunologists refer this pathology to serious complications of vaccination, the causes of which, until recently, remained unclear [1, 6, 7]. According to an international survey, the estimated rate of osteitis/osteomyelitis is 1–700/1,000,000 vaccinated newborns or infants with different strain-derived BCG. Russian authors on their territory found 0.3 of osteitisper 100 thousand of vaccinated with BCG [1]. In the case of other sources 21.1 per 100 thousand vaccinated [5]. In Western Europe (Denmark, Germany, Finland, Sweden, CzechRepublic), the frequency of BCG-osteitis in 70-90 years was 73.0 cases per 100,000 vaccinated children [6, 8, 9, 12]. For publication [4], their frequency was 22 per 100 thousand of vaccinated.

Total number of publications concerning this complication is limited. In view of this problem diagnostics of BCG-osteitis at this time remains unsolved. This situation is explained by the peculiarities of the disease, the difficulty of pathogen detection and its identification. While it is clear that, the selection of standard bacteriological mycobacterium from the affected area of the bone is the most reliable method for confirmation of tuberculosis etiology [1, 5]. However, the mycobacterium in BCG-osteitis is found in to European research only in 56 % - 67 % of cases [7, 8, 12]. Russian researchers diagnose it only in 24 - 50%, depending on atypical form of the pathogen and technical capabilities of the laboratory [1]. Publications in reference to bacteriological nature of osteitis are absentin Ukraine. Thus, formally given the above mentioned,

including microbiological testing data, the frequency of postvaccinalosteitiscan beunderstated and cannot be treatedetiopathogenetically. Thus, BCG disease etiology cannot be excluded by the negative results of bacteriological studies [7, 12]. In such situations the cytological and histological verification methods are of great importance [2, 3, 5, 9]. There were publications concerning molecular-genetic techniques for verification of such processes [7, 13]. But not all laboratories are able to perform such studies [12, 13].

Urgency of the problem is determined by innovation and imperfect knowledge of BCG-osteitis, and factors, mentioned above as well as the lack of adequate number of publications on the subject.

The goal of the work was to investigate the incidence and clinical course of inflammatory diseases of the skeletal system in children of Slobozhansky part of Sumy region, draw attention of wide medical community to the problem of the existence and features of BCG-osteitis. To study the possible connection of specific osteitis with BCG vaccination and to establish possible factors that can contribute to the development of such complications.

Materials and methods.67 children, treated in the surgical department of Sumy Regional Children's Clinical Hospital and Sumy Regional Clinical TB Dispensary were examined. The age of patients ranged from 8 months to 6 years. All hospitalized patients were diagnosed with inflammatory diseases of the skeletal system. In all cases studied "TB" history of family and close circle, enquired information about vaccinations, analyzed the results of tuberculin tests in dynamics. During examination, patients showed BCG vaccination scar on the left shoulder. Clinical, biochemical and microbiological study of material obtained from osteobiopsy and surgical operations were completed. Traditional X-ray and ultrasound was also performed.

Results and discussion. The largest number of pediatric patients - 38 (56.7 %) live in eastern Sumy region of Ukraine. This region is considered the most polluted by industrial waste and emissions of public and private transport. [4]

Patients' age: under 1 year - 20 (29.9 %) children, 1-2 years - 18 (26.9 %), 2-3 years - 12 (17.9 %), 3-4 years - 7 (10.5 %), 4-5 years - 8 (11.9 %), 5-6 years - 2 (2.9 %) - (Table 1).

Table 1

Distribution of patients by age of children

Osteomyelitis type		Tuberculous	Nonspecific	Total
Up to 1 year	Absolute #	7	13	20
	Relative #	23,3%	35,1%	29,9%
1-2 years	Absolute	12	6	18
	Relative	40,0%	16,2%	26,9%
2-3 years	Absolute	6	6	12
	Relative	20,0%	16,2%	17,9%
3-4 years	Absolute	1	6	7
	Relative	3,3%	16,2%	10,4%
4-5 years	Absolute	2	6	8
	Relative	6,7%	16,2%	11,9%
5-6 years	Absolute	2	0	2
	Relative	6,7%	0	3,0%

The table shows that the vast majority of patients with inflammatory diseases of the bones were younger than 3 years: with tuberculousosteitis - 25 (83.3 %) with non-specific osteomyelitis - 25 (67.7 %) children. Frequency of tuberculosis osteomyelitis was 1.2 times greater (P> 0.05). Among patients of 1 year osteomyelitis of non-specific etiology dominated - 35.1 % of children and tuberculousosteitisoccurred in 23.3 %, which is less than 1.5 times (P < 0.05). At the age of 1-2 years, patients with tuberculosis osteomyelitis was 12 (40 %), and patients with osteomyelitis of non-specific origin - 6 (16.2 %), which is less than 2-fold (P < 0.05). In the age group of 2 - 3 years osteitistuberculosis etiology occurred in 6 (20 %) children, and non-specific etiology - in 6 (16.2 %), which is less than 1.2 times. So the difference in the frequency of specific and non-specific osteitis 1 year was in favor of non-specific - 1.5 times and 2 times the difference in favor of specific osteitis, which occurred at the age of 1-2 years, with a probability indicates the prevalence of osteo-tuberculosis 2 years. In the age group of 2-3 years, there has been some difference in the incidence of osteitis in favor of specific, but it was not accurate - in 1.2 times (P> 0.05). That is, in this age "alignment" frequency osteomyelitis their etiologywas recorded.

No significant differences in the incidence of osteomyelitis by gender of affected children have been identified. Osteomyelitis occurred among boys 53.7% , girls - at 46.3 %, which is less than 1.2 times (P> 0.05).

Children with inflammation of the bone - 45 (67.2 %) patientswerethe residents of the city. However, among patients with tuberculosis osteomyelitis in urban areas 21 children (70%), and the villagers were 9 (30 %), which is 2.3 times more likely (P < 0.05). The nonspecific osteomyelitis among children who live in citiesis 24 (64.9%); in the villages - 13 (35.1 %), i.e.1.9 times more (P < 0.05) in favor of the cities.

Localization process has been established - (Table 2). Most illnesses struck long bones of the lower limbshas been studied- 49 (73.1 %). Thus,tuberculosis hip inflammation occurred among 40 % of children and hematogenous osteomyelitis - in 40.5 %. Tuberculosis and non-specific etiology occurred in 36.7 % and 29.7 %. Shoulder tuberculosis origin is 13.3 %, and non-specific - 10.8 %. The bones of the forearm were affected by tuberculosis in 13.3 % of cases. The patients with non-specific hematogenous osteomyelitis were not. Overall affection of the bones of the upper extremities was observed in 12 cases (17.9 %) less than the disease of the lower extremities in 4.1 -fold ($P < 0.05$). The affection of tubular boneswas diagnosed in 2.8 % of cases, and in flat bones - in 15.3 % cases which is 5.5 times more frequent for flat bones. However, specific and non-specific osteomyelitis short tubular and flat bones struck with the same frequency ($P > 0.05$).

Table 2

The frequency of osteomyelitis localization process

Osteomyelitistype			Tuberculous	Non specific	Total
Localization process	Thighs	Absolute#	12	15	27
		Relative#	40%	40,5%	40,3%
	Shin	Absolute	11	11	22
		Relative	36,7%	29,7%	32,8%
	Shoulder	Absolute	4	4	8
		Relative	13,3%	10,8%	11,9%
	Forearms	Absolute	4	0	4
		Relative	13,3%	0	5,6%
	Short bones	Absolute	1	1	2
		Relative	3,3%	2,7%	2,8%
	FlatBones	Absolute	5	6	11
		Relative	16,7%	16,2%	15,3%

As with non-specific osteomyelitis and tuberculosis in the first place of inflammation was femur, the second - tibial - in third case - flat bones, the fourth - shoulder.

It is noteworthy that the bones of the forearm were affected by tuberculousosteitisin 13.3% of cases , while hematogenous localization has not taken place at all, which may have some differential- diagnostic value.

Only on the basis of clinical symptoms and objective data, tubostitis occurred among 3 (10.0%) children. Other pathognomonic objective data among these children have not been obtained. MBT type of BCG based on the results of bacteriological examination was detected in 11 (36.7%) of cases. Histological and cytological study material was obtained during surgery confirmed tuberculosis granulomas elements in 17 (53.3 %) patients.

Most patients with osteomyelitis had a surgery. Thus, the number of children with tuberculousosteitis osteotomy is 23 (76.7%) individuals, which is 3,3 times more frequent than conservative treatment ($P < 0.05$). Non-specific osteomyelitis of osteotomy was foung among 27 (72.9 %) patients, which is 2.7 times more frequent than during conservative treatment ($P < 0.05$). Thus, differences in the relative frequency of surgical treatment for tuberculosis (76.7 %) and non-specific osteomyelitis (72.9 %) was not ($P> 0.05$). However, the indications for surgical intervention in osteitis various origins were significantly different. Thus, tuberculosis osteomyelitis origin surgery was carried out after failure of conservative treatment and the eradication of the bone defect. Non-specific osteomyelitis cases surgical treatment has been done urgently in order to reduce the pressure inside the bone.

The essence of the operation tuberculousosteitis was as follows: under intravenous anesthesia intra or extra-articularnecrosequestrectomiawas performed, curettage of the walls of the bone cavity following injection into the cavity of the bone

rifampicin powder followed by simultaneous grafting of bone defects by auto material (muscle or bone). This operation has been performed for 20 patients. In specific osteomyelitis cases post surgical treatment is 16 days, and conservative - 25.5 days, which is more than 1.6 times ($P < 0.05$). Further treatment of tuberculosis osteomyelitis is continued on an outpatient basis for 6 months, and then - preventive courses are taken for 2-3 months a year. After non-specific osteomyelitis treatment after surgery durationlasts for 13.5 days, conservative therapy was done with repeated courses of treatment. Thus, the benefits of surgical treatment of children with osteomyelitis of specific and non-specific origin are obvious.

The problem of diagnosis of BCG-osteitis at this time remains unresolved. In Ukrainian literature no clear statistical data on the dynamics of the disease is found. In our observations the clinical diagnosis was found in 11 (36.7%) cases based on the results of bacteriological examination, 17 (53.3 %) according to histological examination and in 3 cases (10.0 %) - by clinical symptoms. The vast majority of tuberculousosteitis was observed among children under the age of 3 years (83.3 %). It is important to remember that diagnosis of osteomyelitis in this age group is of high probability of tuberculosis etiology of the inflammatory process, with the relevant objective and subjective -objective disease-based tuberculosis history and connection with the BCG vaccination.

Conclusion:

1. Over the past 10 years, there were 67 cases of osteomyelitis in preschool age groupsin Sumy region. 30 cases had tuberculosis etiology of inflammation (44.8 %).

2. The vast majority of tuberculousosteitis occurs before the age of 3 years (83.3 %).

3.The patients with tuberculosis osteomyelitis should be given surgical treatment for rapid removal of cell tuberculosis

infection, which reduces the number of bed-days: 1.6 times less than with conservative treatment.

Further research:It is necessary to continue accumulating material for clarification of the clinical course of tuberculousosteitis. When this diagnosis is suspected,patients should be immediately consultedby tuberculosis institutions for confirmation or exclusion of BCG-osteitis. In view of the above it is necessary to focus the attention of wide medical community on the existence of BCG-osteitis and the importance of timely verification.

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MUTATIONEN IM LEUKAEMIA-INHIBITORY-FACTOR (LIF)-GEN BEI WIEDERHOLTEM IMPLANTATIONSVERSAGEN NACH EXTRAKORPORALER BEFRUCHTUNG

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Das Problem der Unfruchtbarkeit ist relevant in der Ukraine. Viele Menschen können mit diesem Problem mit Hilfe der IVF und andere Techniken der assistierten Reproduktion zu bewältigen. Aber nicht immer. Das Implantationsversagen spielt eine bedeutende Rolle bei wiederholt erfolgloser assistierter Reproduktion.

Die hormonelle Regulation der Implantation besteht in Wechselwirkung zwischen Embryo und Endometrium mit der Hilfe Zytokinen und Wachstumsfaktoren. Leukaemia Inhibitory Factor (LIF) spielt hier eine bedeutende Rolle. Es gibt Beweis und Widerlegung seiner Rolle bei der Implantation.

Ersteseite, das LIF-Protein wird im menschlichen Endometrium produziert. Und sehr wichtig ist die Tatsache, dass Peak-Sekretion erforderlich zum Zeitpunkt der Implantation ist. Nicht so lange her, wurde auch festgestellt: Menschliche Blastozysten exprimieren zum Zeitpunkt der Implantation mRNA für LIF-Rezeptoren. Noch ein Beweis besteht darin, dass Endometriale Zellen infertiler Frauen signifikant weniger LIF als die fertiler Frauen sezernierten.

Andereseite Mutationen mit Auswirkungen auf das Expressionsniveau oder die Bioaktivität LIFs treffen ziemlich selten, obwohl gerade die Mutationen im Leukaemia-Inhibitory-Factor(LIF)-Gen als die Hauptursache der reduzierten Sekretion fruhe akzeptiert wurden. Die Mutationsrate bei Frauen mit wiederholtem Implantationsversagen nach IVF/ICSI ist gegenüber fertilen Frauen nicht signifikant erhöht.

Deshalb kann man schließen, dass LIF beim Menschen zwar eine wichtige Teilfunktion bei der Steuerung des Implantationsvorganges einnimmt, aber nicht dringend benötigt für seinen Erfolg ist.

MODERN MEDICAL TECHNOLOGY

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Scientific and technological advances are rapidly changing conditions of human existence. There is a need for the creation and implementation of new medical technologies that meet the needs of the time. Modern information technology is increasingly used in the health care industry , which is very convenient, but sometimes it is necessary. This medicine, including alternative , becomes today a completely new features. Many medical studies simply can not do without a computer and special software to it. This process is accompanied by significant changes in medical theory and practice related to making adjustments to the training of health professionals. Over the past 20 years the use of computers in medicine has increased enormously. Practical medicine is becoming more and more automated.

The priorities of modern medicine is microsurgery diseases of the brain and nerve surgery. Injury and brain tumors can cause severe disruption of individual organs and the whole organism . In order to eliminate the tumor developed aiming brain surgery : a place that must be destroyed without opening the skull, a thin needle is introduced through which the tumor affected with high frequency ultrasound, radioactive or chemical.

Sophisticated research in medicine is inconceivable without computer technology. These studies include computed tomography , magnetic resonance imaging , ultrasonography , studies using isotopes. The amount of information that is obtained in these studies , a person without a computer is not able to accept and process . Tomography - a method of examining the state of the human body in which the derived image of individual thin layers (sections) of the human body, based on the full three-dimensional image, is constructed. Tomography is a major example of the introduction of new information technologies in medicine. In recent years new computer programs that allow for diagnostic images in three-dimensional graphics and animation mode .

THE DA VINCI SURGICAL SYSTEM

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A surgeon may have many problems during and after each surgery, they include: postoperative complications, difficulties during the procedure, long duration of it which causes tiredness of a surgeon. That is why medical engineers invented a new surgical system called da Vinci. It was established in 2010 and has got many supporters since that time.

Using the da Vinci Surgical System, the surgeon has a 3D image inside the patient's body (it translates from an endoscope, which is equipped with a high quality camera and the light source at the tip). The image from the patient's body is available on a large monitor (it means that other surgeons can view the procedure and give pieces of advice to the main surgeon). An advantage over the simple laparoscopic procedure is that da Vinci has 3D image, while laparoscopic generally has 2D.

The system accurately "translates" the surgeon's hand and finger movements into real-time movements of surgical instruments. They are designed with seven degrees of motion (even more than the human wrist). Bending angle is up to 90° which provides a high quality of work and greater maneuverability. Each instrument in this Surgical System has its own function such as clamping, suturing, and tissue manipulation. The da Vinci System allows quick changing instruments during the surgery. It has 3 or 4 robotic arms: 2 or 3 of them are instrumental, and one is endoscopic. Laparoscopic arms are working through 1 – 2 cm cuts which make the procedure less traumatic, less hemorrhagenic, reduce postoperative pain and complications. The accuracy of the work performed is mastered through suppression of the natural hand tremor.

The da Vinci Surgical System is the only one system designed for sitting, which is not only more comfortable, but can also give clinical benefits because of less tiredness of the surgeon. Da Vinci system provides comfortable leveling for surgeon's eyes and hand on the surgical console.

COMPLEMENTARY THERAPY: OSTEOPATHY

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Interest in complementary therapies appeared with people's growing concern for a healthy lifestyle and as they search for ways of promoting health. The therapies range from the medicinal, such as homeopathy and herbal medicine, to the physical such as massage and manipulation. Many of the therapies, including acupuncture and ayurveda, have arisen in the East and been adapted for Westerners. Using techniques of manipulation and massage, osteopaths work on bones, joints, muscles and connective tissues of the musculoskeletal system to improve their functions and health of the whole body.

In the late 19th century the American army surgeon Dr Andrew Taylor Still found that he could cure disorders with manual techniques alone, and he put his ideas together to launch a new therapy – osteopathy. Dr Still believed that good health depended on the proper functioning of the body's framework. The muscular-skeletal system supports and protects all the organs of the body, so it must work well for the body tissues to be healthy, the brain and nervous system to be responsive and for the circulatory, lymphatic and digestive systems to operate efficiently.

Most people think of osteopathy as a therapy in connection with bad backs, but it has much wider applications. In cases of osteoarthritis, for example, osteopathy can relieve pain and stiffness associated with disorders and can improve mobility.

Osteopathy also helps conditions that are aggravated and in some cases caused by problems of the musculoskeletal framework. Examples include premenstrual syndrome, recurrent sinusitis, asthma, migraines and tension headaches. It can aid the recovery from sports injuries and from occupational problems caused by spending long periods at a computer screen, on the telephone or driving, or simply from poor posture.In pregnancy osteopathy provides a drug-free way to relieve

backache, which often occurs because of the change in posture and weight gain, as well as heartburn and constipation.

Osteopaths are qualified to carry out orthopedic, neurological and circulatory system examinations, so your practitioner may perform tests on parts of your body other than the bones and muscles. An osteopath has a wide range of techniques that are generally aimed at loosening and freeing elements, rather than repositioning them. These include different methods that gently stretch the muscles and ligaments as well as osteopathic soft tissue massage. Other methods are rhythmical movements of joints or high velocity thrust techniques, which can cause joints to click and are designed to improve the range of motion. Gentle release techniques are also widely used, especially on children and elderly people.

Cranial osteopathy is a special branch of osteopathy. It was developed in the 1940s. Cranial osteopaths claim that compression and moulding of the cranium, or skull, can occur during childbirth or as the result of trauma or long-term tension. This can lead to health problems because they can affect the rhythm of the cerebrospinal fluid in the cranium and spine. Osteopaths believe they can sense pulsations of the cerebrospinal fluid, which are known as the cranial rhythmic impulse. By manipulating the bones of the cranium, they can restore the fluid to the balanced rhythm.

This gentle therapy is suitable even for newborn babies, as well as for children and adults. Problems are diagnosed and treated with a range of manipulative techniques. Difficulty feeding, colic, wind, disturbed sleep, headaches, ear, nose and throat problems, asthma and behavioral disorders can all be treated. It is usually imperceptible, so you may be unaware that something is happening, apart from feeling the osteopath's hands. Sometimes you may experience a warm sensation as tension is released from the body. Osteopathy leaves people feeling deeply relaxed and claims to treat an individual by stimulating body’s own defenses.

Osteopathy is now recognized by most conventional doctors and is one of the most accepted complementary therapies.

TELEMEDICINE IN UKRAINE

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Telemedicine - a modern informatization trend of medicine that involves the use of modern information and communication technologies for remote diagnosis and treatment, assistance in emergency situations and training of medical staff.

Telemedicine is one of the application areas of medical science and it's developing is very fast. The main goal of telemedicine is to create conditions under which the assistance of highly qualified medical professionals will be available not only to residents of large cities, but also to those patients who live far from specialized medical centers and are unable to get an advice of a doctor. This issue is extremely important for Ukraine as urgent medical advice is often vital.

Telemedicine becomes important in a state of emergency related to natural and man-made disasters. Remote consultation will allow objectively assess the situation and take appropriate decisions.

Modern digital telemedicine systems can transmit images of the patient to the doctor across the globe, with virtually no loss of quality. According to the experts, the purely technical aspect of this is not so difficult.

In Ukraine telemedicine was used in 1935 in Lviv by team of doctors and scientists led by Professor Mariana Franco and his co-author Professor Witold Lipinskiy for the first time. The results of examinations of the heart passed for 500 meters to the Institute of Pathology. Examination of these was performed jointly with Professor Franco.

Professor Nikolai Mikhailovich Amosov is the founder of Ukrainian Cardiac Surgery. Some researches were carried out in biological and social cybernetics, expert systems.

Since 2000, the Telemedicine in Ukraine is developing very quickly. It is impossible to cover all projects, networks, events that occur in our country over the past few years and associated with the introduction and development of telemedicine and eHealth.

Two international projects on prenatal medicine deserve special attention, some telemedicine networks were built in several regions in Ukraine, thanks to these projects.

The first project is Ukrainian-American Program of Birth Defects Development.

The second project is Swiss-Ukrainian program "Health of Mother and Child," which organized the server work for asynchronous telemedicine consultations on Perinatology. Both networks exhibit a sufficient number of teleconsultations, a clinical efficacy, positive training effect and manage the transportation of patients to specialized health care facilities.

More than 6 years have passed since the telemedical network of "Telecard" was created and launched in Ukraine. It covers 25 regions including Sumy region. Now a multilevel, actually operating digital telemedical system has been built oriented at urgent diagnostic assistance in cardiac pathology at all levels of health care system, organizing effective telemedical interaction and, as a result, saving thousands of lives. With the system "Telecard" more than 130 thousands of telemedical consultations were held. This gave the possibility to reduce mortality rate from myocardial infarction and other cardiac pathologies in some regions of Ukraine. Dozens of thousands of telemedical consultations were namely held between feldsher's stations, ambulatories and highly specialized cardiac centers.

Telemedicine is indispensable in such fields of medicine as pediatrics, physiology, dermatology. Physicians have the possibility to give and get consultations, discuss diagnosis, transmit the results of investigations, perform model operations for surgeons in regional institutions and students as well, take part in the videoconferences.

Practical, scientific and methodical experience accumulated in Ukraine allowed to form a basis for the rational and efficient use of telemedicine and e-management as a valid tool of public administration of health service.

CRYOMEDICINE

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Cryotherapy is a relatively new form of treatment in which the body is briefly exposed to very cold temperatures in order to promote healing and other therapeutic results. Cryotherapy has been shown to decrease inflammation of the body's tissues, muscles and joints. It can also help improve the body's circulation and healing, and also slow down cellular metabolism and reproduction. Cryotherapy can help to reduce pain and muscle spasms in the body as well as reduce the swelling of injuries. Cryotherapy has also been shown to promote faster healing in joint, muscle and tendon injuries.

How does Cryotherapy Work?

Cryotherapy works by lowering the skin temperature of the body very rapidly and for a short period of time — usually for just a couple of minutes, and no more than 4 minutes. This is accomplished by spraying the body with a fine mist of safe, non-toxic nitrogen. (Nitrogen actually makes up 80% of our natural atmosphere.) The recipient steps into a cryotherapeutic chamber about the size of a spray-tan booth and receives the treatment while standing up. This dramatic but brief reduction in the body's temperature causes the release of a sudden burst of adrenaline, giving an immediate boost to the body's immune system. This immune system improvement can last for days or even weeks after the treatment. There is also a shorter terms release of endorphins, the body's natural painkiller. This changed physiology within the body can result in accelerated healing and promote increased well being in all of the body's organs, cells and systems.

What are the Benefits of Cryotherapy?

The reported benefits of cryotherapy include improved circulation, better metabolism, detoxification of the skin, liver and lymph systems, accelerated healing, cellular and tissue repair, and improved immune function. Cryotherapy can promote faster muscle regeneration from injuries and quicker recuperation from fatigue. All of these healing benefits are possible, and cryotherapy is a relatively safe and non invasive procedure. It can also promote increased endurance, speed and strength, result in better skin tone, a reduction

in cellulite, less insomnia and better sleep, lower stress levels and lower levels of anxiety and depression.

Cryosurgery

Cryosurgery is the application of extreme cold to destroy abnormal or diseased tissue. Cryosurgery has been historically used to treat a number of diseases and disorders, especially a variety of benign and malignant skin conditions. Technical achievements in cryogenic engineering gave the possibility to get the necessary volumes of liquid nitrogen which became the main cryogenic agent in medicine since 1950. Radical cryosurgical operations became possible only after 1980 when fundamental investigations in cryobiology and cryomedicine have been mainly completed. Cryosurgery works by taking advantage of the destructive force of freezing temperature on cells. When their temperature sinks beyond a certain level ice crystals begin forming inside the cells and, because of their lower density, eventually tear apart those cells. Further harm to malignant growth will result once the blood vessels supplying the affected tissue begin to freeze. Cryosurgery has achieved considerable result in complex treating many diseases. Skin tags, warts, small skin cancers are candidates for cryosurgical treatment. Several internal disorders are also treated with cryosurgery, including liver cancer, prostate cancer, lung cancer, oral cancers, cervical disorders. Generally, all tumors that can be reached by the cryoprobes used during an operation are treatable.

Cryosurgery in dentistry

In dentistry, the method of local freezing has certain and valuable enough advantages as compared with routine surgical interventions. Main periodontal diseases that can be treated by cryosurgery are parodontosis, hypertophic gingivitis, epulis, papilitis and pericoronitis. On tunica mucosa of the mouth, such diseases as a leukoplakia, red flat herpes, chronic recurrent aphthous stomatitis, trophic ulcers and some other benign and malignant neoplasm are quite often. Cryotherapy in many diseases of tunica mucosa of the mouth, both in elderly and in young age is expedient necessity in comparison with surgical treatment or electrocoagulation.

Cryosurgery is a minimally invasive procedure, and is often preferred to more traditional kinds of surgery because of its minimal pain, scascarring and cost. However, there are risks involved as with any medical treatment. Damage to nerve tissue is of a particular concern.

SMART BIOMASK

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According to the research of the University of Texas at Arlington, people who suffered burns of the face could have their facial skin regrown by wearing intelligent biomechanical masks. Scientists at UT Arlington in cooperation with the US Army and Northwestern University have a great aim. This invention is going to help suffered people to live comfortably in the modern world.

Under conventional treatment, damaged tissue is removed and then special grafts are replaced on the burned place of the skin. But there are some flaws of such a procedure – it can often cause speech problems, scarring and other skin deformities. Besides, all the accompanying problems may require multiple operations.

This modern biomask consists of several layers each with the specialized function. The first one is the gel that lies against the skin. The second is a flexible layer which covers the previous. The flexible layer includes actuators and sensors. These actuators and sensors are made for keeping the layers of polymer pushed up against the skin to promote, speed up and advance healing. On the top of the second flexible layer there is a hard framework, which holds the layers lying under, in order to retain the desired shape.

The structure of the new mask is very complex. Inside all of the layers, a web of microfluidic channels and microvalves creates sub-atmospheric pressure on the burned face. The presence of vacuum promotes and speeds up the skin healing.

Special sensors inside the healing mask can help physicians to control general condition of facial tissue. It helps doctors to regulate and check the activity of biomask effects, while the process of treatment is going on.

Scientists and inventors hope that this mask will be able to noticeably improve the skin grafts, which can lead to different problems and which are very difficult to find.

TOOTH SENSOR

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Fear of the dentist can be a very serious issue for many children and adolescents. According to academic researches into Dental Fear and Anxiety, some young people hate dentist visits so much that they often refuse to co-operate, or worse - they don't even go to the dentist. Scientists at Princeton and Tufts have been working a thin tooth sensor that may limit the amount of times we will need to get our teeth checked.

The sensor will alert you when it detects any bacteria that could cause cavities, plaque buildup, or any other infections. The scientists say that the new sensor can recognize human oral activities, such as chewing, drinking, speaking and coughing. It also can help to better understand people's habits and identify potential health problems, such as if a person is smoking or drinking too much. The sensor is so small that it can either fit inside an artificial tooth or straddle a real one.

The most important part of the sensor is an accelerometer. Using an accelerometer to monitor different activities of the mouth, scientists use tiny wires within the sensor to carry data to a computer, though they say that future models of the sensor will use Bluetooth for wireless reporting.

The researchers presented their device at the International Symposium on Wearable Computers in Switzerland. They say that the tooth sensor is 93.8% accurate in recognizing oral activity. The information collected by the sensor could be very helpful to dentists, doctors and other scientists, since the device can provide information on teeth grinding, eating or drinking levels, and it could even measure stress levels.

Because the sensor is placed inside the mouth, safety is very important. All electronic parts are sealed and if the sensor is swallowed, it will pass through the body without causing harm.

Tooth sensors can become standard procedure in dental and health offices for health monitoring.

3D PRINTERS IN MEDICINE

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3D printing is a process of making a three-dimensional solid object of any shape from adigital model. 3D printing is achieved using an additive process, where successive layers of material are laid down in different shapes. While 3D printing technology has been around since the 1980s, it was not until the early 2010s that the printers became widely available commercially. The industry use includes rapid prototyping, rapid manufacturing, and mass customization. At the dawn of rapid prototyping, a common predication was that 3D printing would transform manufacturing. That has not quite happened, and like so many emerging technologies, rapid prototyping has found its foothold in a surprisingly different field: medicine.

- Osteofab is a product made by a British company Oxford Performance Materials. Over the past few years, the company has also pioneered the application of the stuff, primarily through additive manufacturing. An American patient received a FDA-approved skull patch made of the material, which had been carefully molded and printed to fit 75 percent of his unique skull geometry.
- Employees at American company Organovo learned to create small fragments of artificial liver. They used different cell types instead colors.
- A team of scientists from Cornell University (USA) is now developing a technique of restoration of damaged intervertebral discs in the 3D printer. Implementation of the technology is in its final stage.
- Fripp's printer can turn out 150 prosthetic eyes an hour—and the details, like iris color, size, and blood vessels, can be easily customized based on each patient's needs.

Additive manufacturing requires manufacturing firms to be flexible in order to remain competitive. This arc of technological development will counter globalisation, as end users will do much of their own manufacturing rather than engage in trade to buy products from other people and corporations.

BACTERIA IN OUR LIVES

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Bacteria are an integral part of our lives. They don't only surround us externally, but also live inside us. Most people think that the bacteria are harmful micro-organisms, but they are wrong. Along with the pathogenicity, they play an important role in ensuring the normal functioning of our body. Microbial colonies found on or in the body are normally benign or beneficial. Bacteria are the basis of the normal microflora of many systems, especially of the digestive tract. These microbial colonies carry out a series of helpful and necessary functions, such as aiding in digestion. They also protect the body from the penetration of pathogenic microbes. These beneficial microbial colonies compete with each other for space and resources.

When this balance is disturbed, by such diverse things as repeated and inappropriate antibiotic exposure or alcohol misuse, these colonies exhibit a decreased ability to check each other's growth. This can lead to an overgrowth of one or more of the disturbed colonies which then may damage some of the other smaller beneficial ones. This condition of microflora is called dysbacteriosis. Dysbacteriosis treatment is carried out in several stages.

Modern diagnostic techniques, the most used in medical practice, are a routine bacteriological examination of feces, PCR-diagnostics, chromato-mass spectrometry and biochemical research of microbial metabolites.

Goiter may be a symptom of certain diseases. For example, it is possible for diseases characterized by pain in the abdomen, diarrhea, flatulence, falling appetite, pronounced weakness, malaise, decreased efficiency and headache.

So, be more responsible for your diet, do not abuse the use of antibiotics unless they are absolutely necessary and stick to a healthy lifestyle and then you will live in harmony with your body and its inhabitants.

ROBOTS IN MEDICINE

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Robot is a machine with a human-like behavior which partially or completely fulfills human function when interacting with the surrounding world. Robots are divided into three types: robots with the specific program of actions, operator-controlled robots and artificial intelligence robots.

No doubt, that the development of new technologies had a great impact on medicine. At present, doctors can perform operations, which seemed impossible ten years ago. Robots have become indispensable medical assistants.

The branch of medicine which needs smart machines most of all is surgery. Robots were first used for carrying out operations as early as in the late 1980s. The most common robot controlled by the operator during a surgery is a da Vinci robot (da Vinci Surgical System). Nowadays there are thousands of such robots around the world.

Let us consider the general view and components of surgery robots using a da Vinci robot as an example. It has three components: control panel with a screen, external screen, surgery console with four working manipulators. All the operations and movements of the machine are directed by an experienced surgeon.

Robot-assisted surgery has many advantages as compared to common operative treatment:

- Great degree of surgical accuracy
- Significant reduction in wound infection
- Reduced need for blood transfusion
- Short postoperative period
- Minimal risk of complications
- Absence of large postoperative scars
- Good visualization and range of movements.

Robot-assisted surgery has enormous prospects of its development and improvement. Many scientists are working on it and improving robots year by year.

SEASONAL CLEANSING

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Spring is coming.Perhaps it is time to get your life into alignment with the changing seasons by doing a little spring cleaning of your own, both physically and emotionally. Here are some helpful ideas to start on your journey to a simpler and more natural lifestyle:

1) Start your mornings off right with living foods. Since spring is symbolic of renewal and growth, one way to implement this theme into your diet is to start every day off right with living foods. Freshly-squeezed juices, living seeds, organic fruits and vegetables, and other raw foods are far more substantial and life-giving than many of the "dead" foods people commonly eat for breakfast. Besides their many nutritional benefits, living foods help to detoxify the body and improve the pathways through which energy and life are imparted.

2) Detoxify your thoughts. Physical detoxification is important, but so is also mental detoxification. One way you can help this process along is by journaling your life. Write out all the thoughts in your head when you run into a specific problem and go back and edit it later in a day or a week. By revising your own thought processes in this way, you can gradually cut out the things in your life that are holding you back or tearing you down.

3) Cleanse your living environment. They say cleanliness is next to godliness, but one thing is for sure – messy living spaces lead to messy, unhealthy lifestyles. Take the time to clean out your desk and wardrobe, for instance, and get rid of the things you no longer need or use. This processnot only will help bring you peace of mind, but it will also give you a fresh opportunity to simplify your life and reorganize your own life's trajectory for the better.

4) Work toward building friendships and community. Humans were made for connection, and two of the most important connections we can make in this life are friendship and community.

Take some time to interact with people in your life who matter to you, or even those whom you are merely interested in getting to know better. Give your friends and family members a call, or write them personal letters and mail them the old-fashioned way. Doing so will not only enrich your own state of being, but also help spread the love to someone who might really be needing it.

5) Clean out your pantry. If revitalizing your dietary choices has been on the agenda for some time now, why not take an entire day (or weekend) to clean out your pantry and reorganize your life with living, whole foods. Throw out all the processed, preservative-laden processed foods and replace them with fresh foods, especially those that are grown locally.

6) Learn from the past and move forward. It is easy for people to become overwhelmed by the circumstances of their pasts, especially when these circumstances have caused lasting pain, guilt, and confusion. But reorienting your mind to view the past as a learning experience for the future can help you to go of all the bad and be prepared to embrace the good. By clearing out the thoughts that damage your outlook on life today, you can help fertilize the soil of your mind to accept new states of being built upon ideas of strength, courage, confidence, and love.

7) Spend more time outdoors. Spending more time outside is beneficial for both body and mind. Besides exposing your skin to vitamin D-producing sun rays, immersing yourself in the outdoors by hiking, biking, or simply taking a long walk on a regular basis will help get your blood flowing, energize your body, and renew your spirits. Studies have actually shown that spending more time outdoors can help improve concentration, promote more rapid healing of injuries, and even make you happier overall. Be sure to spend time outside both with others and by yourself, as both states of interacting with nature are uniquely beneficial for your well-being.

SARS PREVENTION

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Severe acute respiratory syndrome (SARS) is a viral respiratory disease of zoonotic origin by the SARS coronavirus. This is a serious form of pneumonia. It is caused by a virus that was first identified in 2003. Infection with the SARS virus caused acute respiratory distress (severe breathing difficulty) and sometimes death.

SARS is a dramatic example of how quickly world travel spread a disease.

Researches are working on several types of vaccines for SARS, but none has been tested in humans. If SARS infections resume, follow these safety guidelines if you're caring for an infected person.

Wash your hands. Clean your hands frequently with soap and hot water or use an alcohol-based hand rub containing at least 60 percent alcohol.

Wear disposable gloves. If you contact with the person's body fluids or feces, wear disposable gloves. Throw the gloves away immediately after use and wash your hands thoroughly.

Wear a surgical mask. When you're in the same room as a person with SARS, cover your mouth and nose with a surgical mask. Wearing eyeglasses also may offer some protection.

Wash personal items. Use soap and hot water to wash the utensils, towels, bedding and clothing of someone with SARS.

Disinfect surfaces. Use a household disinfectant to clean any surfaces that may have been contaminated with sweat, saliva, mucus, vomit, stool or urine. Wear gloves while you clean and throw the gloves away when you're done.

Follow all precaution for at least 10 days after the person's signs and symptoms have disappeared. Keep children home from school if they develop a fever or respiratory symptoms within 10 days of being exposed to someone with SARS. Children can return to school if signs and symptoms go way after three days.

HEALTHY LIFESTYLE

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Nowadays our life is getting more and more tense. People live under the press of different problems, such as social, ecological, economic and others. They constantly suffer from stress, noise and dust in big cities, diseases and instability. A person should be strong and healthy in order to overcome all difficulties.

In the Middle Ages very few people lived to 40. Today life expectancy is more higher than it was. There are some reasons of it. One reason is that, due to medical research, many illnesses were eliminated. The second one is that fewer people die in wars. Generally, the life of modern man is endangered by many factors. One is the increasing pollution of the environment by industry and transport; another one is sedentary lifestyle of people living in cities and towns, that is, the majority of the population of the planet. The third one is the quality of food we eat and water we drink which results in a lot of diseases. Healthy food is very important factor. Overeating causes many dangerous diseases. The daily menu should include meat, fruits, vegetables, milk products, which are reach in vitamins, fat, proteins and etc. The fourth one is that living in big cities leads to epidemics.

The only possible way of preserving your health is, therefore, healthy way of life which includes keeping fit, balanced meals, and giving up unhealthy habits like smoking, drinking alcohol, and, of course, drugs.

Physical fitness is a general state of good physical health. For anyone who really wants to be healthy, fitness has become an integral part of their lives. The fitness boom resulted in a rise in the numbers of people participating in sports and sports activities. It is a well-known fact that even moderate physical activity can protect you

from heart diseases and strokes, obesity and influenza. There are many ways of keeping fit. Firstly, you could visit health and fitness clubs. A lot of health and fitness clubs, public leisure centres, huge indoor water parks are very popular among people of all ages. Secondly, regular exercise is necessary. People of different ages can choose or design exercises that will fit them. Some people do aerobics or yoga; others prefer weight training in a gym. Many people prefer walking or jogging which are the cheapest and most accessible sports. Doing some sport or other on a regular basis is the best way of keeping fit. There is a number of sports activities are popular among the old and the young: football, swimming, cycling, skiing, skating, fishing, hunting, roller-skating, etc. Also it is very important to tell children from an early age that sport is very good for health.

To stay healthy one must, of course, abstain from smoking. Everybody knows smoking is hazardous for your health and can lead to fatal diseases like cancer. Smoking should undoubtedly be banned in all public places.

If your health is good, you are always in a good mood. Certainly it's hard to follow all these recommendations, but every person have to choose between healthy life style and numerous illnesses.

CONCENTRATION OF LEUKOCYTESSUBPOPULATION IN BLOOD SERUM OF CHILDREN SUFFERING FROM ACUTE OBSTRUCTIVE BRONCHITIS AND THYMOMEGALIA

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In recent times children suffering from acute obstructive bronchitis (AOB) need increased attention of Ukrainian doctors due to the fact that almost 30% of all patients having respiratory diseases suffer from this pathology. The immune system together with one of its main organs - thymus is one of the main components involved in the pathogenesis of bronchopulmonary diseases because infectious agent acts directly through it.

Aim of the study was to investigate the level of CD3+ and CD21+ in serum of young children having acute obstructive bronchitis, depending on the presence of concomitant thymomegalia (TM).

101 children having AOB were under the supervision. They were divided into 2 groups: group I - patients suffering from AOB having no TM, II group - patients having both TM and AOB. The control group consisted of 26 virtually healthy children.

In the acute stage of the disease children of group I had concentration of CD3+ 2 times lower comparing with the children in the control group ((47,8±1,03) % ($p<0,05$)), while the level of CD21+ increased to (24,5±0,61) % ($p <0,001$). CD3+ content in the second group of children at the beginning of the disease decreased to (14,12±0,24)% ($p <0.001$). Alongside CD21+ in serum increased more than 2 times (27,52±1,61 %, $p < 0,01$).

Patients suffering both from AOB and TM had the content of CD21+ significantly higher than the patients having AOB without TM ($p <0.001$). Meanwhile, the concentration of CD3+ in the second group of children was significantly lower than in group I patients($p <0.001$).

Concomitant TM probably leads to harder imbalance of subpopulation of leukocytes and aggravates AOB in children on the early stages of the disease.

NEUROTIC CONDITIONS OF STUDENTS

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Neuroticism is a psychological condition which is characterized by violation of mental functions of the nervous system, of the status syndrome of emotional arousal, stress, fear, anxiety. This condition prevents the achievement in training and threatens the health of students, and then stipulates a number of somatic diseases.

Student's body belongs to the youth period of ontogenesis, it still blends in disharmony of sexual metamorphosis and decompensation of CNS . Studies show a great dependence on the situations of adolescence, failure to act on it.Of particular attentionis anxiety.

Followers of various psychological studies consider the problem of anxiety from different points of view. However, there is no common understanding of the nature of anxiety.

C. Hornes believed that it is based on insecurity, loneliness helplessness in theface of a dangerousworld.

Empirical studies of anxiety have shown that real imaginary situation can occur in one or several dominant emotions such as fear, anger, shame.

Neurophysiological studies of anxiety are based on the idea that in the normal functioning of antagonistic systems there is a balanced interaction, i.e. activity, between them. Anxiety is the result of simultaneous high activity of trophotropicsystems.

To determine the level of anxiety of students is used a test developed by Ch.Spilberh. This is the only method that allows differentially alter anxiety as a personal quality and condition. This test is a reliable informative way of self-esteem anxiety. To measure

the overall level of anxiety was used a personal scale of manifestation of anxiety of J.Teylor.

The result of the research shows that among 28 students of the 2nd year of Physics and Mathematics Department only 20 students have low rates of situational anxiety, 8 students have middle rates and nobody has high rates there.

Among the 2nd year students of Foreign Languages Department only 17 students have high rates of anxiety, 10 students – medium rates, 1 student has low rates. In addition, girls are more disterbed.

The 4th year studentshave other rates of anxiety: a high rate of anxiety was observed in 9 girls and 1 boy, 2 girls and 8 boys have the middle rates . Among the 1st year students only 10 people have high rates of anxiety, 18 students have middle rates, there are no low rates. High level of anxiety brings disruption to learning activities and behavior of students, creates a negative emotional background perception of life situations.

Thus, the only equitable teacher-student communication in the classroom contributes to the performance of training activities, the activity of students, self-confidence, a full realization of their abilities.

WHAT IS HEALTHY LIVING?

Y. S. Streletskiy – SumyStateUniversity, group SU – 31
D. O. Marchenko – E L Adviser

Healthy living refers to involving yourself in habits that improve your general well being to maintain a functional and metabolic efficiency. Making healthy food choices, staying physically active and maintaining a healthy weight are essential for good health of all people.

Community development is practices of civic activists, involved citizens and professionals to build stronger and more resilient local communities.

Economic development generally refers to the sustained, concerted actions of policy makers and communities that promote the standard of living and economic health of a specific area.

Millions of people fall ill and many die as a result of eating unsafe food.

Genetically modified foods are foods derived from organisms whose genetic material has been modified in a way that does not occur naturally.

Tobacco products are products made entirely or partly of leaf tobacco as raw material.

The consumption of alcohol carries a risk of adverse health and social consequences related to its intoxicating, toxic and dependence-producing properties.

Physical activity is defined as any bodily movement produced by skeletal muscles that require energy expenditure.

Ionizing radiation is the energy or particles produced by unstable atoms of radioactive materials.

Chernobyl accident was a disaster that affected not just Ukraine, Belarus and Russia but the whole world, changing attitudes to nuclear safety on a global scale.

Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere.

Healthy lifestyle is an important part of our life.

FUNCTIONAL MRI

Avdeev S. LS-203
Mokhonyok Z.A. – EL Advisor

Medical technology has advanced in recent years. Now one can dissect the body in the finest photos and create three-dimensional models of organs and tissues with the help of scanning technology to find in malfunction and to diagnose diseases.

Nevertheless, a relatively new type of scanning technology called functional magnetic resonance imaging (FMRI) raises this technology one step further. FMRI can not only help to diagnose diseases of the brain, but allows doctors to get into our mental processes to determine the way we think and feel. Functional MRI can detect even if we tell the truth.

FMRI is based on the same technology as the usual MRI – it's a noninvasive technique that uses a strong magnetic field and radio waves to create detailed images of the body. But instead of creating images of organs and tissues, as MRI does, functional MRI looks at the blood flow in the brain to detect areas of its increased activity. These changes in blood flow are transmitted to computer and help doctors to understand better how our brain works.

Mapping the brain, for example, researchers try to identify the region of the brain where pain is processed to create more effective analgesic agents. Other researchers investigate the brain region responsible for time perceiving to invent new methods of treatment for patients who have difficulty with time perception.

Functional MRI can also help scientists in planning the operation. If a patient is in need of brain surgery, doctors can first scan the brain for determining the exact site of tumour to avoid damage to important brain functions.

However, MRI also has its drawbacks. Firstly, it is quite expensive. Secondly, MRI can capture a clear image only if scanned person remains completely motionless. And thirdly, researchers still do not clearly understand how it works.

The biggest complaint from researchers is that MRI can only look at blood flow in the brain. It can't interrupt with the activity of

individual nerve cells (neurons), which are crucial for mental functions. Each region of the brain scanned by MRI consists of thousands of individual neurons. The latter can discover a lot of unique facts, because certain areas of the brain shown on MRI can present a number of different functions. That's why it is complicated to distinguish what kind of brain activity is currently represented on the scan.

Some critics argue that MRI is nothing more than a high-tech version of phrenology, a pseudoscience of the 19th century that claimed a person's character to be identified by the shape and form of the skull. In future researchers hope to make MRI more scientifically reliable by improving its accuracy, focusing on individual neurons. These scientists believe to get a more complete and accurate picture of the brain activity by recording the electrical activity of neurons.

EXERCISE AS A PROPHYLAXIS OF HEART DISEASES

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N.Horobchenko, EL adviser

Over the past century we have become increasingly sedentary due to the technical advancements of today's world. Studies have shown that the decline in our physical activity associated with these advancements plays a great role in the decline of our health. Cardiovascular diseases are the main cause of mortality in almost all countries, accounting for 36% of all deaths in 2013. They cover a range of diseases related to the circulatory system, including ischemic heart disease and cerebrovascular disease (or stroke). A sedentary lifestyle is one of the 5 major risk factors (along with high blood pressure, abnormal values for blood lipids, smoking, and obesity) for cardiovascular disease.

The American Heart Association has stated that the leading cause of heart disease is physical inactivity. The Surgeon General's report states that "regular physical activity or cardiorespiratory fitness decreases the risk of cardiovascular disease mortality in

general, prevents or delays the development of high blood pressure in people with hypertension". Physical activity also aids in the prevention of heart disease by improving a person's cholesterol level. Research on physical activity and cholesterol have shown that exercise raises the level of "good" cholesterol, lowers the triglyceride level, improves the total cholesterol ratio, and slightly lowers the level of "bad" cholesterol. Physical activity refers to any body movement produced by the skeletal muscles and resulting in a substantial increase over the resting energy expenditure. Exercise benefits the individual throughout the entire lifespan and it is never too late to start. As a child, physical activity is crucial to the growth and strengthening of bones and muscles. As an adult, whether 30 years old or 75 years old, exercise is crucial to health maintenance and quality of life.

Thirty minutes of moderate activity daily equates to 600 to 1200 calories of energy expended per week. It is important that the exercise a person chooses is appropriate for the present physical ability. Three components to exercise (modality, duration and intensity) need to be balanced so that they meet the needs and the abilities of the individual.

In conclusion, physical activity and exercise is a crucial and critical component to healthy living. It is never too late to start exercising, so long as the type of physical activity engaged in is appropriate to one's physical ability. Start out slowly and safely and build up to the recommended frequency, duration, and time.

HEALTHY LIFESTYLE

I. Yakovenko, Sumy State University, LS-202
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Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Usually, we start to think about our health when we have some problems with it. Human health is based on genetic factors, lifestyle and ecology. Our lifestyle plays serious role because it is something we can change to improve our health.

Lifestyle is the typical way of life of an individual, group, or culture. It has 45-50% impact of our health. Healthy or unhealthy lifestyle will most likely be transmitted across generations. According to the study, when a 0-3 year old child has a mother who practices a healthy lifestyle, this child will be 27% more likely to become healthy and adopt the same lifestyle. The most important thing in the healthy lifestyle is proper food.

Active lifestyle can be a miracle. Active, open and full of happiness people in 99% are healthy. Health and bad habits are not compatible. If you want to be healthy, you should stop smoking, drinking alcohol and taking drugs. By the way, right schedule of the day is a very considerable part of lifestyle. Right schedule means a healthy 8-hour sleep, getting on going to bed at the same time every day and waking up without the an alarm (it means you have got enough sleep).

Good mood is one of the main parts of healthy lifestyle. It helps us to stay positive because psychological health is also very important. We should take care of ourselves. It is not meaningless to tell yourself, “I am strong enough; I have the power to improve my life.” It is very serious not to be alone. We have much more chances to get the result in company, not alone. Even though, the company should have the same idea, otherwise it will be an obstacle.

No one can deny that our lifestyle is the most influential part of our health. We should take several steps to make our life better, so let’s start with healthy lifestyle.

TREATING MACULAR EDEMA FOLLOWING RVO

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N.Horobchenko, EL Adviser

Retinal vein occlusion (RVO) affects 16 million people worldwide, usually the middle-aged or older. It is caused by thrombosis, the clogging of the retinal veins, which may occur in the four branch veins – branch vein retinal occlusion (BVRO), or in the central vein, which is formed by the combination of the four branch veins – central vein retinal occlusion (CVRO). Left untreated (or if treatment fails), persistant RVO can lead to macular edema (ME), the swelling of thickening of the macula caused by leaking blood vessels.

The standart care was grid laser photocoagulation for ME and non-ischemic BRVO and observation of macular edema in the case of CRVO. Today, care differs: implantable and injectable drug-based options are available, notably a dexamethasone intravitreal implant (Allergan's Ozurdex) and inhibitors of vascular endothelial grows factor (VEGF), including an antibody and a fusion protein. Recently, pars plana vitrectomy has also been shown to be effective for improving macular thickness, volume, and sensitivity in patients with ME secondary to ischemic CRVO.

Dexamethasone is a potent, water-soluble corticosteroid with many therapeutic indications, mostly anti-inflammatory. The intravitreal dexamethasone-containing implant comprises micronized dexamethasone within a biodegradable copolymer of lactic and glycolic acids. The implant is inserted into the eye through a small pars plana puncture using a customized applicator system and it releases dexamethasone over a period of months.

It has been demonstrated that high concentrations of dexamethasone are sustained in the retina and vitreous during the first 2 months after the injection, and lower concentrations are sustained up to 6 months. Ozurdex has been proven effective, approved by the regulatory agencies in the United States and Europe, and is currently used in clinical practice for the treatment of ME associated with RVO and noninfectious posterior uveitis. It has also

been demonstrated to be effective for the treatment of diabetic ME in vitrectomized eyes.

All published studies of Ozurdex focused on its short-term efficacy and safety, following patients for 6 or 12 months only. Information regarding the response to multiple treatments, the optimal retreatment interval, and long-term follow-up is lacking. The purpose of this study is to evaluate the long-term visual prognosis and complications of patients who received Ozurdex injections for the treatment of ME in RVO.

VEGF inhibitors such as ranibizumab revealed a beneficial effect on visual function and reduced central macular thickness in eyes with BRVO and CRVO. However, with respect to the shorter half-life of ranibizumab, numerous injections are required to achieve and maintain this therapeutic effect. This is also valid for bevacizumab which is injected every 6 weeks for 12 months with a significant improvement of visual acuity (VA) and reduction of macular edema.

A pre-treatment with a VEGF inhibitor may have an impact on the time until a recurrence of macular edema following the first Ozurdex implantation is seen. However, it appeared that the time to recurrence could not be prolonged. Recurrences occurred after a period of 3.2 and 3.8 months. Interestingly, the number of recurrences (and subsequent retreatments) in patients receiving a monotherapy with the dexamethasone implant was lower in BRVO compared with CRVO patients, which may be well explained by the more favorable natural course of macular edema associated with BRVO.

In conclusion, combined treatment using Avastin (bevacizumab) and Ozurdex showed slightly better functional outcome for CRVO patients. Increased intraocular pressure and cataract progression was frequent and should be considered when an individual treatment is planned.

CHARACTERISTIC OF COLON MICROBIOCENOSIS AMONG PRESCHOOL CHILDREN SUFFERING COMMUNITY-ACQUIRED PNEUMONIA ASSOCIATED WITH IRON DEFICIENCY ANEMIA

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An important physiological role in the body of the child has a normal intestinal micro flora, which in connection with person's microorganism is regarded as a kind of extracorporeal organ. According to several authors, 88.6 % of children with acute respiratory diseases reveal disbiotic changes of intestinal micro flora. Among patients with pneumonia revealing frequency of the third level dysbiosis is 44.4 %, and besides quantitative violations there occurs also a high-quality disintegration of components of micro ecological system.

Objective: To investigate the qualitative and quantitative changes in micro biota of the colon among preschool children, patients with community-acquired pneumonia (CAP) associated with iron deficiency anemia (IDA).

Materials and methods:

We examined 48 children of the age from one to three years old concerning the CAP. The patients were divided into two groups. Group I included 25 children with CAP without IDA. Group II included 23 patients with CAP associated with IDA of light degree. The control group included 18 healthy children of appropriate age.

Studies were carried out during the acute illness (for 1 day admission to hospital) and the period of early recovery and cancellation etiotrop treatment (10-14 days).

Results and Discussion

The studies revealed significant changes in the quantitative and qualitative composition of the colon micro flora at children with CAP.

When analyzing disbiotic changes of the colon among children with CAP without IDA at the beginning of the disease was found a significant decrease in the number of bifida and lactobacilli, Escherichia coli and an increase of containing the pathogenic

microflora (PM), staphylococci, and fungi of the genus Candida compared to the control group.

Similar changes in micro-ecology of the colon at the beginning of hospitalization were observed at children with CP with IDA. Among patients with CAP with IDA compared with the data of healthy children were identified significant reduction in the amount of bifida bacteria, Lactobacillus, Escherichia coli, increase in PM, Staphylococcus, and fungi of the genus Candida.

When comparing the colon micro flora at children of groups I and II at the beginning of the disease, it was found that patients with CAP with IDA had a significant decrease in the intensity of colonization by bifida bacteria, lactic acid bacteria and a significant increasing the number of PM against the relevant indicators among children with CAP without IDA.

Estimating changes in the composition of intestinal micro flora among children with CAP in both groups after standard treatment showed no positive dynamics. Thus, among children in group I the number of bifida bacteria, lactobacilli, Escherichia coli, PM, Staphylococcus and Candida fungi did not change significantly.

Among children with CAP with IDA after treatment the number of lactic acid bacteria, Escherichia coli, PM, staphylococcus and fungi of the genus Candida has not changed relatively to the acute period, while containing of bifida bacteria was significantly reduced.

At the end of treatment indicators such as total number of bacteria and bifida bacteria at children of group II compared with patients in group I were significantly lower, and the titer of PM - significantly higher.

Thus, significant changes of qualitative and quantitative composition of the colon micro flora among children with CAP conditioned by decrease in the detection rate of the indigenous micro flora and increased contamination of given pathogenic and conditionally - pathogenic microorganisms. Disturbance of the colon micro-ecology at children with CAP associated with iron deficiency anemia can be the basis for inclusion in the complex of pathogenic probiotic therapy aimed at correcting the disturbance.

СЕКЦІЯ 6 ІНФОРМАЦІЙНИЙ ПРОСТІР, ПРОБЛЕМИ ЗАХИСТУ ІНФОРМАЦІЇ, ЇЇ ДОСТОВІРНОСТІ ТА БЕЗПЕЧНОСТІ

TECHOLOGY OF KINECT

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I.A. Bashlak – EL Adviser

Kinect (codenamed in development as Project Natal) is a line of motion sensing input devices by Microsoft. Based on a peripheral addition, it enables users to control and interact with their computer without the need for a game controller, through a natural user interface using gestures and spoken commands. The first-generation Kinect was first introduced in November 2010 in an attempt to broaden Xbox 360's audience.

Kinect was first announced on June 1, 2009 at E3 2009 under the code name "Project Natal". Following in Microsoft's tradition of using cities as code names,"Project Natal" was named after the Brazilian city of Natal as a tribute to the country by Brazilian-born Microsoft director Alex Kipman, who incubated the project. The name Natal was also chosen because the word natal means "of or relating to birth", reflecting Microsoft's view of the project as "the birth of the next generation of home entertainment".

Kinect builds on software technology developed by Rare, a subsidiary of Microsoft Game Studios owned by Microsoft, and on range camera technology by Israeli developer PrimeSense, which developed a system that can interpret specific gestures, making completely hands-free control of electronic devices possible by using an infrared projector and camera and a special microchip to track the movement of objects and individuals in three dimensions. This 3D scanner system called Light Coding employs a variant of image-based 3D reconstruction.

Kinect sensor is a horizontal bar connected to a small base with a motorized pivot and is designed to be positioned lengthwise

above or below the video display. The device features an "RGB camera, depth sensor, multi-array microphone and proprietary software", which provide full-body 3D motion capture, facial recognition and voice recognition capabilities. At launch, voice recognition was only made available in Japan, United Kingdom, Canada and United States. Mainland Europe received the feature later in spring 2011. Currently voice recognition is supported in Australia, Canada, France, Germany, Ireland, Italy, Japan, Mexico, New Zealand, United Kingdom and United States.

The depth sensor consists of an infrared laser projector, which captures video data in 3D under any ambient light conditions. The sensing range of the depth sensor is adjustable, and Kinect software is capable of automatically calibrating the sensor based on gameplay and the player's physical environment, presence of furniture or other obstacles.

Described by Microsoft personnel as the primary innovation of Kinect, the software technology enables advanced gesture recognition, facial recognition and voice recognition. According to information supplied to retailers, Kinect is capable of simultaneously tracking up to six people, including two active players for motion analysis with a feature extraction of 20 joints per player. However, PrimeSense has stated that the number of people the device can "see" (but not process as players) is only limited by how many will fit in the field-of-view of the camera

During Kinect's development, project team members experimentally adapted numerous games to Kinect-based control schemes to help evaluate usability. A lot of sport games were made special for Kinect to combine sport and game process. Run games for Kinect are also in great demand.

Price of this device is not very high only 150$ in the USA and 300$ in Europe , so it can be available for everyone.

SAFE WORLD IS THE KEY TO THE SAFE FUTURE

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D.O.Marchenko – E L Adviser

Nowadays, one of the most important purposes of mankind is to make world safer. It is not surprising because our generation has faced a lot of environmental, social, economic and health problems. Although most of these problems are caused by people's activity only people can change their lives for better.

There are many aspects concerning the future of our world. Some of them are well-balanced economic development, technological progress and healthy way of life. If we make some improvements in thesespheres, we will reach desired results.

Economic development is the key for improving public relations between different countries.Systematic regulation of the economy should lead to positive changes in all types of economic activity and quality of life of the population.

Due to technological advancements our life became more comfortable and easy. Every day of our life is full of different modern devices and tools. Technology has both positive and negative influence on our life. As it brings comfort to people it can also bring harm to the environment.A lot of scientists and inventors try to reduce harmful influence of technological progress by improving devices, tools and gadgets. Besides, scientists do researches and create new ways of recycling different technological waste. All in all, technological progress leads to introducing modern technologies into all fields of our life.

The most important thing in our life is health. Everybody should keep fit and do exercises regularly.It is not surprising that old proverb says: "A sound mind in a sound body".People should make the environment more favorable for their health. Everybody can do such little things as planting new trees. These small efforts will provide an excellent result someday. If everyone cares about his health, there will be less diseases in the world and the level of illness will be decreased.

There are a lot of factors which influence our safety, but everybody should remember that our safety depends on ourselves. Each of us plays important role in creation harmonic future. If people understand that, it will be a great step to the major purpose – to make the world safer.

INFORMATION SECURITY: PASSWORDS

Sasha Saltysh– Sumy State University, group IN – 32
S. V. Mikhno – E L Adviser

Many people have accounts in different sites, and the problem is that hundreds of millions of passwords are being compromised by cybercriminals every year.

People finally need to understand that the Internet is a very hostile place, while online service providers need to finally start taking network security seriously.

One of the world's leading password crackers just got better and is now able to crack passwords of up to 55 characters in length and algorithms such as TrueCrypt 5.0+, LastPass and Samsung Android Password/PIN.

Hashcat is a freely available password cracker. It is clearly a dual-purpose weapon: it can be used by security auditors to stress-test company passwords, and it can be used by criminals to crack lists of stolen passwords.

What the new version of hashcat demonstrates is that size is no longer as important as it used to be – it's what the user does with the characters that matters. Length is still important; but rather than just a combination of words or phrases, it should be a mix of characters, numbers and punctuation symbols.

A few weeks ago, SplashData has announced its annual list of the 25 most common passwords:

This year, "123456" has the dubious honor of being the most common –and therefore easiest to crack – password in use on the internet.

The TOP TEN includes "qwerty," "abc123," "111111" and the ever-popular "iloveyou" – all highly susceptible to brute-forcing and cracking algorithms.

List also showed that shorter numerical passwords are coming into use, even though websites are starting to enforce stronger password policies. For example, new to this year's list are simple and easily guessable passwords like "1234" (No. 16), "12345" (No. 20) and "000000" at (No. 25).

Only four in the top 20 seem to be unlinked to numbers or other simple inspirations: “monkey,” “shadow,” “sunshine” and “princess.”

We hope that with more publicity about how risky it is to use weak passwords, more people will start taking simple steps to protect themselves by using stronger passwords and using different passwords for different websites.

So, password strength meters that offer web surfers a visual gauge of how weak or strong a chosen lock may be increasingly present on websites. University of British Columbia and Microsoft studied the effectiveness of a meter that shows users how strong their password choice is compared to other users of a website. In the end, the study shows that password creation behaviors are heavily dependent on context.

One way to create more secure passwords that are easy to recall is to use passphrases – short words with spaces or other characters separating them. It's best to use random words rather than common phrases. For example, “cakes years birthday” or “smiles_light_skip?”

But that’s easier said than done. A good guideline is to use passwords of eight characters or more, with mixed types of characters. But even passwords with common substitutions like “dr4mat1c” can be vulnerable to attackers’ increasingly sophisticated technology, and random combinations like “j%7K&yPx$” can be difficult to remember. Users should consider the use of a password manager, such as Keepass, to generate strong passwords that won’t be found in dictionaries.

And finally, of course, they should use a unique password for each different online account – that way even if it is stolen by a hacker and cracked by hashcat, it will at least be only one account that is compromised.

OS FOR DATA PROTECTION IN MODERN TABLET DEVICES

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Nowadays the tablet devices are steadily increasing in popularity with modern users. Because of their portability more and more people become getting used to them. The new possibilities make it easy to create and carry some data. As a consequence it needs some protection to secure our personal information.

Such corporation as Apple uses special functions to make their customers be sure that all information will be in safe. For instance IPad has “Find My iPad” feature, which allows you to locate and remotely wipe your iPad if it’s lost or stolen. All modern iOS devices also come with a second layer of encryption, called Data Protection. While the basic encryption enabled by turning on passcodes ,second layer encrypts your e-mail messages and their attachments; it can’t be broken even if the passcode is stripped by jailbreaking. Data protection is also available for programmers to use in apps, but few take advantage of it.

Another OS for tablet is Android. The last version of OS includes Google Certificate Pinning with which only the hard-coded valid certificate will be accepted, protecting you from a man-in-the-middle attack. System of access control SELinux prevents from executing of an attacks with using exploits, whose task is to obtain root-privileges. In other words Linux kernel isolates user resources from one another. Google has launched new feature such as ‘Verify Apps’ – an application scanning system the main point of which is watching device for any threats from applications, loaded onto the device from outside of the Google Play Store.

In conclusion it should be noted that a lot of new OS come into the global market and each of them has their own privileges, each implementator is trying to improve developments so that every customer must enjoy the product. We are sure that tech advancement will become so fast-paced that we couldn’t even imagine what technology of securing came into.

E-ZEITUNG

T. Redko – Studentin, GT–11
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Die erste E-Zeitung ist im Jahr 2001 erscheinen. Das war die Rhein-Zeitung. Seitdem haben fast alle Zeitungen auch elektronische Version.

Eine E-Zeitung ist die elektronische Version eines Printmediums. Sie ist durch öffentliche Zugänglichkeit, Aktualität und inhaltliche Vielfalt markiert.

Die Vorteile der E-Zeitungen sind einleuchtend: 1) die Zeitung in einem elektronischen Format (zum Beispiel, im Telefon) kann man immer mithaben (die Printzeitungen sind immer sehr groß im Format, es ist mit E-Zeitungen wesentlich komfortabler); 2) der E-Zeitungleser kann früher informiert sein als der Papierzeitungleser.

Es gibt auch Nachteile: 1) man muss immer Internetzugang haben, um die E-Zeitung zu erhalten (Online-Zeitungen nicht überall gelesen werden können); 2) es ist schlechter und langsamer die Bildschirmtexte zu lesen als gedruckte.

Es gibt noch ein großes Minus. Die Printzeitungen sind unnötige Umweltzerstörung, weil für sie unzählige Bäume gefällt werden müssen, um das Papier herzustellen.

E-Zeitung-Technologien werden ökologisch vorteilhaft eingeschätzt. Die Umweltschützer loben das Ende der Papierverschwendung.

In unserer Zeit mehr große Zeitungen setzen auf den unkomplizierten Vertriebsweg, ihre Ausgaben als Online-Zeitung bereitzustellen. So werden «die Welt», «der Spiegel», «die Zeit», «der Stern» und viele andere als E-Zeitung geladen.

Was ist besser für die Menschen: eine Papierzeitung zu lesen oder E-Zeitung online im Internet? Jeder entscheidet für sich selbst.

Die E-Zeitung wird einen bedeutenden Platz auf dem Markt der Tageszeitungen einnehmen, aber die Papierzeitung wird komplett vom Markt nicht verschwinden.

3D PRINTERS AND PRINTING

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N.V.Malyovana – E L Adviser

What is a 3D printer? Is any fiction or real technology? 3D-printer - a device that uses the method of layering creating of a physical object in a digital 3D-model.In fact 3D printer is a device that can print any volumetric product. 3D-printing can be implemented in different ways and it uses materials. There are the following printing methods such as:

1) laser stereolithography (SLA) - the object is formed from a special liquid photopolymer solidifying under laser irradiation (radiation or mercury lamps).
2) selective laser sintering (born selective laser sintering, SLS) (also English. Direct metal laser sintering - DMLS) - object formed from a fusible powder material (plastic, metal) by its melting by laser irradiation.
3) electron beam melting - similar technologies SLS / DMLS, only here the object is formed by melting metal powder with an electron beam in a vacuum.
4) simulation by fusing (born fused deposition modeling, FDM) - object formed by layering strands of molten fusible working material (plastic, metal, wax).
5) manufacturing facilities using lamination (Eng. laminated object manufacturing, LOM) - to a fiber formed of an adhesive (heat, pressure) of thin films of the working material, by cutting (by laser beam or a cutting tool) of the respective circuits in each layer.

Since the possibility of such printing is obvious, so the applications of this technology are:

1. For rapid prototyping, ie, rapid prototyping models and objects for further refinement.
2. For rapid production - production of finished parts of the materials supported 3D-printers
3. Production of various trifles at home.
4. Development of the University of Missouri, allowing to apply a special bio-gel clumps of cells of the specified type. The development of this technology - growing full bodies.
5. In medicine, in prosthetic implants and manufacturing (fragments of skeletons, skulls, bones, cartilage). Conducted experiments on the printing of donor organs.
6. For the construction of buildings and structures

7. Production buildings experimental techniques (cars, telephones, electronic equipment)
8. Food Production

SMART HOUSE

R.Y. Dogadaylov – Sumy State University, group ET – 11
L. A. Denisova – E L Adviser

An important aspect of human life is house. After all, a house, apartment or flat are the places where a person spends most of free time. A house is a fortress which should be cozy, comfortable, beautiful and what is the most important - safe and at the same time needs to be economically efficient. That is the maximum resource saving electricity, water, heat and natural gas.

It starts with the design of the building. Taking into account weather conditions, it is necessary to choose the location, exterior, environmentally friendly materials which we will use for the building.

Next, to fill the house with all necessary furniture and appliances. Smart House is a program on the microcontroller, which manages all the communications that are connected to home, appliances that are in the house and in the yard. It includes control of the lighting, the systems of engineering, the microclimate. The program runs all the time when you get home or when you leave, this is done through a variety of modes. For example, the mod "Standby" saves resources and keeps the appliances off, the temperature is kept as low as possible depending on the weather outside . The program also monitors the airing space, water heating, cooking, etc. And all this can be controlled by the telephone or Internet.

It is worth noting that it is safe. This is done with the help of sensors: gas and water leaks, broken glass and the volume. With the penetration of a burglar into the house breaking glass sensor is triggered and an alarm alerts the police and the owners of the incident.

Smart house is an organism which can understand you. It gives it owner a completely new quality of life. And this is really actual today.

MODÈLE CONCEPTUEL D'UN SYSTÈME AUTOMATISÉ DE PLANIFICATION DES COURS

these 1 Krivodub A. C.
Professeur – Aleksakhina T.A.

Les questions de l'automatisation des fins de planification de leçons de l' université a toujours été et reste d'actualité. Actuellement, le marché des produits logiciels offre un grand choix d'un système d'horaires de cours. La plupart d'entre eux n'est pas normalisé d'un produit logiciel. Et, en combinaison avec un coût très élevé, de l'enseignement supérieur est assez problématique d'acheter un système similaire.

La tâche de la rédaction d'emploi du temps est simple à première vue, la mise en scène est assez complexe. Lors de l'élaboration de la formation de planification doivent nécessairement prendre en compte un certain nombre de conditions et de restrictions. Avant de procéder à la conception du produit, il est important de comprendre la progression de planification, d'étudier les relations existantes entre les unités de l'établissement d'enseignement, tenir compte de la spécificité du processus d'éducation dans l'université.

Afin de soumission ordonnée du domaine du problème automatisé de planification des cours, la nécessité d'élaborer un modèle conceptuel de leur système. À la suite de l'analyse des exigences conceptuelles ont été identifiés les objets d'information posées par les propriétés de chaque objet de certaines restrictions d'objets identifiés la communication entre eux, les types de relations, ainsi que les caractéristiques des objets entrant dans le système de planification des horaires de cours à l' université.

Objets d'information sont les entités qui sont représentées sous la forme d'une classe d'objets semblables, ce qui devrait être pris en compte dans le modèle conceptuel. Comme on le voit l'essence de tous les participants dans le processus éducatif (enseignants, groupe), la discipline, l'installation de fonds de classe, le personnel de la formation et de résultats des horaires de cours.

Pour identifier de manière unique une instance d'une entité ont été mis en évidence les attributs des entités, comme des mots clés et ne clés. Ils contiennent des ensembles de propriétés des objets entrant dans le système. Ont été également pris en compte les principales responsabilités, qui effectue chaque objet dans le

processus de formation. Comme résultat, on a été développé un modèle conceptuel de système automatisé de planification des universités, est représentée sur la figure 1 (les attributs des entités dans le graphique), ce qui est logique d'un schéma de base de données pour le système projeté.

NANOTUBES

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Carbon nanotubes are long structures of cylindrical shape with a diameter from one to several tens of nanometers. They consist of one or several rolled into a tube hexagonal graphite planes. Sumio Iijima synthesized them by the method of arc evaporation. In the mid-twentieth century there were two research teams from the USA and New Zealand.

Carbon nanotubes can be found in nature, for example, in shungite extracted in Karelia. The process of nanotube production is hard to control. It is accompanied by formation of carbon of some other forms. In the process of its production, there were used solutions of hydrocarbons and catalysts. The key feature of carbon nanotubes is their electrical conductivity. It is important for microelectronic devices because it facilitates the process of further reduction in size.

The form of nanotubes can be single-layer, multilayer, straight, spiral, with open and closed ends of cylindrical structure. Usually the length of nanotubes is from 10 to 1000 microns, but Renselayera Polytechnic Institute (USA) received a 20 cm nanotube.

For practical application the properties of nanotubes can be divided into several areas of use: physical, physico-chemical and mechanical.

Today nanotubes are used in the production of packaging materials. They are also used in sensors of fire-prevention system. They significantly increased their efficiency and accelerated response time in several times. Introduction of nanotechnology in production and scientific activities will increase the efficiency of these work areas and will bring computer engineering to a new level.

In future their use will lead to miniaturization of various microelectronic devices.

THE EYE TRIBE TRACKER WILL CHANGE THE WORLD

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L. Y. Khmelik

The Danish company The Eye Tribe presents their last invention called the first device for inputting information with help of the human's eyes, which is really suitable for the mass use.

The Eye Tribe Tracker system consists of special software and hardware. The last is a sophisticated electronic device that looks like a small oblong dull black plate, connected with the PC by the USB cable.

The Eye Tribe Tracker has been created to improve "mutual understanding" between the electronics and the man with the help of technology, which will allow managing mobile devices and even computers by the eye movements. The control commands, of course, are based on the eye direction. This way you can control your music, manage the game, keep files under control, etc. The Tracker's field of use is very wide. Besides, this technology can be very useful for disabled people.

The price of the version of The Eye Tribe Tracker system, designed for the using in the environment of the operating system Windows, is only 99 dollars.

But there is A Software Development Kit for the software developers, which greatly simplifies the integration of The Eye Tribe Tracker system capabilities into the functions of existing and newly developed software, including computer games. The self-taught programmers with its help will be able to adapt existing interface of lots of applications, and talented professionals will create a lot of fundamentally new methods of control electronics by the eye

movements. Developers say: getting the coordinate data on the screen, where a man looks at a particular moment, requires adding only ten lines of code.

Accordingly, The Eye Tribe Tracker can be used for everything: beginning from web-surfing to complex projects, like tactic computer games with many commands and settings.

But there is some disadvantage – you have to choose the screen size about 24 inches to make the devise work correctly. Otherwise the problems with tracking movements of the pupils at low amplitude appear. But this is compensated by the small price.

The gadget is compact and has dimensions of 20 × 1,9 × 1,6 cm and a weight of 70 g, it is convenient to use in everyday life or offices.

The team has been taking pre-orders for Eye Tribe Tracker since early September.

The company presented its invention in Berlin in the middle of October 2013.

QUANTUMCOMPUTING

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Computers built on the principles of quantum physics promise a revolution on the order of the invention of the microprocessor or the splitting of the atom. The vast increase in power could revolutionize fields as disparate as medicine, space exploration, and artificial intelligence.

First proposed in the 1970s, quantum computing relies on quantum physics by taking advantage of certain quantum physics properties of atoms or nuclei that allow them to work together as quantum bits, or qubits, to be the computer's processor and memory. By interacting with each other while being isolated from the external environment, qubits can perform certain calculations exponentially faster than conventional computers.

Quantum computing was first theorized less than 30 years ago, by a physicist at the Argonne National Laboratory. Paul Benioff is credited with first applying quantum theory to computers in 1981. Benioff theorized about creating a quantum Turing machine. Most digital computers are based on the Turing Theory. While a normal Turing machine can only perform one calculation at a time, a quantum Turing machine can perform many calculations at once.

Today's computers, like a Turing machine, work by manipulating bits that exist in one of two states: a 0 or a 1. Quantum computers aren't limited to two states; they encode information as quantum bits, or qubits, which can exist in superposition. Quantum computer has the potential to be millions of times more powerful than today's most powerful supercomputers.

This superposition of qubits is what gives quantum computers their inherent parallelism. According to physicist David Deutsch, this parallelism allows a quantum computer to work on a million computations at once, while your desktop PC works on one.

Quantum computers also utilize another aspect of quantum mechanics known as entanglement. To make a practical quantum computer, scientists have to devise ways of making measurements indirectly to preserve the system's integrity. Entanglement provides a potential answer. This allows scientists to know the value of the qubits without actually looking at them.

So, what's the biggest challenge? You need a very good control over individual particles. You can't just shove all the particles together because they would interact with each other in an unpredictable way. You need to be able to trap and direct them, but when the particles interact with the trap itself it makes them lose their information, so you need to make sure that you design the trap well.

Quantum computers could one day replace silicon chips, just like the transistor once replaced the vacuum tube. But for now, the technology required to develop such a quantum computer is beyond our reach. Most research in quantum computing is still very theoretical. However, the potential remains that quantum computers one day could perform, quickly and easily, calculations that are incredibly time-consuming on conventional computers.

Quantum computing is not well suited for tasks such as word processing and email, but it is ideal for tasks such as cryptography and modeling and indexing very large databases.

Will quantum computers look like our desktops and laptops do now? The very first quantum computers will probably fill a room. It's going to take a while to get to desktops. Really, actually what is going to happen is you are going to have a hybrid laptop with a quantum chip and a classical chip.

PIRACY

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Piracy is an act of criminal violence at sea. It can include acts happened on land, in the air, or in other bodies of water or on a shore. Piracy or pirating is the name of a specific crime under customary international law.

The modern pirate stereotype owes its tradition mostly to that of the Caribbean pirate and such depictions as Captain Hook, Long John Silver and various adaptations of the pirates. In these and many other books, movies, and legends pirates are portrayed as "swashbucklers" and "plunderers."

The earliest documented acts of piracy refer to the Aegean and Mediterranean in the 14th century BC. The great or classic era of piracy in the Caribbean extends from 1560 until the 1720s. Many pirates came to the Caribbean after the end of the War of the Spanish Succession, staying in the Caribbean to make attempt for making a living by robbery and kidnapping of people on nearby islands.

In the popular modern imagination, pirates of the classical period were rebellious, clever teams who operated outside the restricting bureaucracy of modern life. Pirates were also depicted as always raising their Jolly Roger flag when preparing to attack a vessel.

Unlike traditional Western societies of the time, many Caribbean pirate crews of European descent operated as limited democracies.

Today there is internet piracy. It is the unlawful reproduction or distribution of any copyrighted digital file that can change hands over the Internet. This can be done with music files, videos and other materials. It has become a worldwide crime problem, because of the relative ease with which it can be committed, even over long distances.

Nowadays governments of many countries provided some laws against internet piracy in order to protect author's rights. Nowadays piracy is as big problem as it was in time of Caribbean pirates. To protect society from such type of violence governments of most developed countries should help other countries create new laws to eradicate piracy.

STEALTH TECHNOLOGY

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Stealth technology also termed as LO technology (low observable technology) is a sub-discipline of military tactics and passive electronic countermeasures, which cover a range of techniques used with personnel, aircraft, ships, submarines, missiles and satellites to make them less visible (ideally invisible) to radar, infrared, sonar and other detection methods.

Diffused lighting camouflage was trialed by the Royal Canadian Navy from 1941 to 1943. In 1945 the concept was followed up, but for aircraft, by the Americans and the British.

Stealth technology is not a single technology. It is a combination of technologies that attempt to greatly reduce the distances at which a person or vehicle can be detected; in particular radar cross section reductions, but also acoustic, thermal, and other aspects:

- Internal construction;
- Radar-absorbing material.

Ships have also adopted similar methods.

But there are some limits and countermeasures for radar stealth:

- Low-frequency radar;

Low-frequency radar is limited by lack of available frequencies - many are heavily used by other systems, and by the radar's size, making it difficult to transport.

- Acoustics;

Acoustic stealth plays a primary role in submarine stealth as well as for ground vehicles. Submarines use extensive rubber mountings to isolate and avoid mechanical noises that could reveal locations to underwater passive sonar arrays.

- Visibility.

Most stealth aircraft use matte paint and dark colors, and operate only at night. Lately, interest in daylight stealth has emphasized the use of gray paint in disruptive schemes, and it is assumed that Yehudi lights could be used in the future to mask shadows in the airframe or as a sort of active camouflage.

MAGLEV TRAINS

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Maglev trains are wonderful inventions that fly on air. They use magnets to levitate and propel the trains forward. There is no friction between the train and the track!

The batteries can levitate the train for 30 minutes without any additional energy. Linear generators in the magnets on board the train use the motion of the train to recharge the batteries.

Different speeds are achieved by varying the intensity of the current. Collisions between trains are unlikely because computers are controlling the trains' movement.

A train is composed of sections, each contains 100 seats, and a train can have between 2 and 10 sections. A train can travel at about 300 mph.

The train can travel at about 300 mph. It can accelerate to 200 mph in 3 miles, so it is ideal for short jumps.

It uses less energy than existing transportation systems. For every seat on a 300 km trip with 3 stops, the gasoline used per 100 miles varies with the speed.

They use less land than conventional trains, and they can follow the landscape better than regular trains.

The train makes little noise because it does not touch the track and it has no motor. Therefore, all noise comes from moving air. This sound is equivalent to the noise produced by city traffic.

This train uses superconducting electric magnets in the vehicle to levitate and propel the train. Once electrified, these magnets do not require additional energy.

Maglev is a safe and efficient way to travel. The magnetic field created is low, therefore there are no adverse effects. Governments have mixed feelings about the technology. Maglev trains need to be viewed as a technology of the future. Because they cannot share the infrastructure that exists for wheeled trains, maglevs must be designed as complete transportation systems.

PHONEBLOKS

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Nowadays cellphones become outdated so fast.

You can add extra storage to many smartphones now, but you can't upgrade much else – certainly not the camera, processor or the screen. Instead of having a fixed specification, you can tailor-make your own phone using 'bloks' – individual modules such as cameras, processors and batteries. There could be different speeds of processor, different capacity batteries - the choice is nearly limitless.

Phonebloks would consist of a main board onto which bloks could be snapped on by the user like Legos. Each blok is responsible for a unique function of the phone, much as a desktop computer has a distinct sound card, graphics card, processor, monitor, and power supply. As a result, instead of replacing the entire phone, one could simply replace the defective or performance-limiting part. If the consumer wanted a better camera, he or she could swap their small generic camera blok for a larger zoom camera from a manufacturer such as Nikon or Canon instead of buying a phone with a better camera.

In theory, this would lead to fewer people throwing away their phones and contributing to the ever-increasing problem of electronic waste. Smartphones based on the Phonebloks system would be sold part by part. When assembled, the phone would have a screen covering the entirety of the front, volume buttons and headphone jacks along the outer edge, and bloks clicked into the back, forming a rectangular block shape overall.

It's essentially a very similar concept to the way we upgrade our PCs.They are all connected to the base. And the base connects everything together. Electrical signals are transferred through the pins. And two small screws lock everything in place.

Phonebloks also has the benefit of allowing you to easily replace broken modules with new ones.

The project started in October 2013 and has already huge fan group, more than 960 th. supporters and 370 mln social reach

PROTECTION OF INFORMATION: MAIN PROBLEMS AND DECISIONS

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At the present stage of development of the world the role of information technology increases and its introduction into all areas of activity, which significantly changes the structure of society.

Information field is a collection of information, information infrastructure, entities engaged in the collection, creation, dissemination and use of information and appropriate regulation of social relations.

Under the influence of the information flow significantly changes the content of the interaction processes of joint activities. Competition becomes particularly noticeable because of the struggle for achieving information superiority, for possession of more developed information resource that offers better control over information resource opponent.

As information resources of society (state, businesses and individuals) are of some value with the appropriate material representation and require protection from a variety of influences in its essence, which can lead to a decrease in the value of information resources, information security, reliability and safety are an urgent problem.

Information should retain the confidentiality, integrity, availability. Also, it should be reliable and safe.

Violation of protection of computer systems, and thus a threat to the information comes from such causes as unauthorized access, viruses rooting, technical failure of equipment network purposeful actions of personnel and human error (low qualification). Hence, the main hazards to information are caused by human activity.

There are three main types of problems related to the protection of information in computer systems. Firstly, its interception in violation of privacy. Then, the problem of updating information, when the original message is changed or completely replaced by others and sent to the recipient. And finally, the problem of authorship information substitution that enables electronic fraud.

Protection of electronic information can be obtained only on the basis of the use of cryptographic methods that address the most important problems of automated processing and secure data transfer. These modern high-speed cryptographic transformation techniques can keep the original performance of information systems.

Requirements of information security have led to non-traditional ways to protect digital information, one of which is the authentication of electronic information in circumstances where the parties exchange information donot trust each other. This problem is related to the creation of digital signatures.

The possibility of information security is provided by such tools as copyright or protection orders online stores via video-confirmation. This can be implemented by post as well as online.

Problems of information security is widely considered at the state level. In Ukraine, protection of information is provided by the Constitution of Ukraine, laws of Ukraine "On Personal Data Protection", "On Information", "On Access to Public Information", the Civil Code, international normative legal acts ratified by the Government of Ukraine and others.

PERPETUAL MOTION MACHINE

A.LebedevaIN-21 D.VikulovaIN-21
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For many centuries scientists and inventors have tried to create perpetual motion machines, but even in those times they understood that the attempts to build such machines were vain and foolish.

Bishop Wilkins' magnetic perpetual motion machine can be a good example of "freak and curiosity". They say he believed it was perpetual motion machine, but in fact it is the illustration of waste of time.The first documented perpetual motion machines were described by Indian author Bhaskara. This machine represents awheel with containers and mercury in them. One more example of perpetual motion machine is Taccola's wheel. Leonardo da Vinci analyzed the results of other inventors and came to a conclusion that either displacement of gravity or disbalance of the device could not lead to perpetual motional. Mark Anthony Zimara suggested a perpetual motion machine without the use of water or a weight, like the wheel of a windmill. This is an early example of the "boostrap" principle of perpetual motion.

Over the time inventors became less interested in creating just a perpetual motion machine, they wanted an "over-unity" performance — unlimited energy output for free. "Over-unity" means an energy efficiency greater than one. Let's assume we are to get 200% efficiency. What is the best way to do it? The first device being powered should shore 50% of its energy with the device adjusted to it.

Having tested all these devices there is no doubt that in theory they have the right to existence, but practically as Jacob Leupold said "you can't get more work out than you put in"!

WINDSCREEN WIPER

Yavorska V. Y., PM-11
A.M.Diadechko,EL A

Today both car drivers and car passengers cannot imagine this kind of vehicle without a windscreen wiper. There are only a few who know its history and evolution.

A windscreen wiper is a device used to remove rain and debris from a windscreen or windshield. A wiper generally consists of an arm, pivoting at one end and with a long rubber blade attached to the other. The blade is swung back and forth over the glass, pushing water from its surface.

In 1903, a U.S. inventor Marie Anderson (born Mary Anderson) invented and patented the idea of fluctuating wiper blades. This idea was met with resistance, but by 1916 all American cars were equipped with wipers.

In 1964, an American inventor Robert Kearns (1927-2005) invented, patented and introduced the idea of "delay" or "slot" in the wiper operation.

Wipers may be powered by a variety of means, although most in use today are powered by an electric motor through a series of mechanical components, typically two 4-bar linkages in series or parallel.

Mercedes-Benz pioneered a system called the Monoblade, based on cantilevers , in which a single arm extends outward to reach the top corners of the windscreen, and pulls in at the ends and middle of the stroke, sweeping out a somewhat 'M'-shaped path.

Most windscreen wipers operate together with a windscreen (or windshield) washer; a pump that supplies a mixture of water, alcohol, and detergent (a blend called windshield washer fluid) from a tank to the windscreen.

Like many other devices used in our everyday like, modern vehicles are now available with driver-programmable intelligent (automatic) windscreen wipers that detect the presence and amount of rain using a rain sensor.

ARGUABLE PATERNITY INVENTIONS

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A.M. Diadechko, E L Adviser

Invention is a new scientific or technical idea, and the means of its embodiment and accomplishment. To be patentable, any invention must have utility and its idea needs to be proved as workable. Only economically feasible inventions, that satisfy specific needs can be called innovations. Invention is intellectual property so it is protected by the law with patents.

Patent is a limited legal monopoly granted to an individual or firm to make, use, and sell its invention, and to exclude others from doing so. Patentable items fall under four classes: machine, manufacture, process, composition of matter.

Modern communicative possibilities allow inventors to keep up with the times and to know what has been already invented or is still being invented. But some recent history examples show that problems with protecting innovating ideas really existed.

For example, in 1787, an ex-soldier John Fitch launched the first ever steam-powered boat. The patent he was granted later, in 1791, did not give him a monopoly, which left the way clear for later inventors to create similar designs. And Robert Fulton patented a financially viable and profitable paddle steamer in 1807, without needing to pat for the pattern.

Lizzie Magie created “The Landlord’s Game” game in 1903, well-known now as “Monopoly”, without patenting it. In the 1930s, an unemployed salesman named Clarence B. Darrow saw the business potential of Monopoly and patented it.

Xerox developed the first fully functional version of the Graphical User Interface (GUI) in 1981, yet the technology quickly found its way to competitors Apple. It is often said that Steve Jobs “stole” the GUI idea from Xerox after various visits to the company in the 1980s. This is not quite true. Xerox was provided with a healthy share of Apple stock in exchange for engineer visits.

HISTORY OF MOUNTAIN BIKING

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The history of Mountain Biking begins in the mid 1970's when the sport of bicycling was rapidly developing. A few biking 'freaks' in the state of California did not just turn a hobby and a number of innovative improvements into a profession with their new 'fat tire' bike. Instead they set in motion a worldwide boom.

Mountain bikes are typically ridden on single track trails, fire roads, logging roads, and other unpaved environments. These types of terrain commonly include rocks, washouts, ruts, loose sand, loose gravel, roots, and steep grades (both inclines and declines). Mountain bikes are built to handle this terrain and the obstacles that are found in it like logs, vertical drop offs, and smaller boulders.

Mountain bike construction differs from a typical bicycle in many ways. The most noticeable differences are the inclusion of suspension on the frame and fork, larger knobby tires, more durable heavy duty wheels, more powerful brakes, and lower gear ratios needed for steep grades with poor traction.

The history of the mountain bike includes cyclo-cross in Europe and the Roughstuff Fellowship in the UK. The name "mountain bike" first appeared in print in 1966 as "mountain bicycle". The mountain bike was a modified heavy cruiser bicycle used for freewheeling down mountain trails. The sport became popular in the 1970s in Northern California, USA with riders using older single speed balloon tire bicycles to ride down rugged hillsides. Joe Breeze, a bicycle frame builder, used this idea and developed what is considered the first mountain bike. The 2007 documentary film by Klunkerz presents this period of off-road cycling in detail. But only in the late 1970s and early 1980s road bicycle companies started to produce mountain bicycles using high-tech lightweight materials, such as M4 aluminum. The first mass production mountain bike was the Specialized Stump jumper, first produced in 1981.Throughout the 1990s and 2000s, mountain biking moved from a little-known sport to a mainstream activity complete with an international racing circuit and a world championship.

MAGNIFYING TRANSMITTER

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The magnifying transmitter was intended by Nicola Tesla for the wireless transmission of electrical energy. It is a high power harmonic oscillator, an air-core, multiple-resonant transformer that can generate very high voltages. In normal operation the magnifying transmitter is relatively silent, generating a high power electric field, but if the output voltage exceeds the design voltage of the elevated terminal, high-voltage sparks will strike out from the electrode into the air. In his autobiography, Tesla stated that "...I feel certain that of all my inventions, the Magnifying Transmitter will prove most important and valuable to future generations."

In 1899 a larger magnifier was constructed in Colorado Springs, Colorado. This machine was used to conduct fundamental experiments in wireless telecommunications and electrical power transmission. Nicola Tesla demonstrated that Earth behaves as a smooth polished conductor of very low resistance. At Colorado Springs, Tesla used his magnifying transmitter in an attempt to artificially stimulate terrestrial standing waves. Based upon observations made with the device, Tesla reported that earth resonance modes involving an electric current flowing through the earth can be excited. He claimed to have discovered a fundamental earth resonance frequency of nearly 11.78 Hz, which is somewhat higher than the fundamental earth-ionosphere cavity Schumann resonance found to exist by researchers in the 1950s in the general vicinity of 7.3 Hz.

With the help of magnifier Tesla conducted experiments that contributed to our understanding of electromagnetic propagation and the earth electrical resonances. He researched ways to transmit energy wirelessly over long distances, first by transverse waves, and then, possibly, by longitudinal waves. Tesla received patents on wireless transceivers designed to develop terrestrial standing waves. The magnifying transmitter was the basis for Tesla's Wardenclyffe Tower project.

MASCARA: SAFE OR DANGEROUS?

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The word “mascara” derives from the Spanish word “mascara “ which means ‘mask’ or ‘stain’.

As for the history of mascara, ancient Egyptians played a large part in its rich history. Dating as far as 3400-30 B.C., Egyptians used bone and ivory as mascara applicators, and blended kohl with crocodile dung, water and honey to create the first mascara.

Victorian Cosmetic Rituals let Victorian ladies experiment with many different cosmetic recipes, but the products were never marketed, and thus, never sold.

The Birth of the First Mascara Product came in 1917,when Eugene Rimmel, a founder of Maybelline Cosmetics, created the first packaged cosmetic mascara. Produced from a blend of petroleum and black coal dust, mascara began its history.

The chemical production of Mascara goes now in either of two ways, with or without water. We call it anhydrous in the case when no water is involved. The ingredients are combined and then heated. Then the mixture is stirred in a vat till a half solid substance is produced. When no water is used, a ratio of thickener and water are added to one another. Color and waxes are added into a machine called a homogenizer.

With the Carbon black color Mascara, the ratio of surface area and volume is really high and that is what makes it such a unique substance.

The customers are surprised to know that bat guano is always mentioned to be present in mascara and other cosmetics. Rather than guano, guanine is used.

What makes mascara clump? Mascara is made mostly of three things: color, wax and oil. These three ingredients are not particularly antiseptic though mascaras have an anti-bacterial agent to provide a longer storage time. It is unlikely and unusual, but mascara does have capability to grow bacteria. So, ladies, you have to remember that mascara is not as safe as you may think.

CHEWING GUM- 5000 YEARS OF HISTORY

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A.M. Diadechko, E L Adviser

Chewing gum is a soft, cohesive substance intended for chewing but not swallowing. Humans have used chewing gum for at least 5,000 years.

Chewing gum in various forms has existed since the Neolithic period. 5,000-year-old chewing gum made from bark tar, with tooth imprints, has been found in Kierikki, Yli-Ii, Finland.

Forms of chewing gums were also chewed in Ancient Greece. The Greeks chewed mastic gum, made from the resin of the mastic tree. Many other cultures have chewed gum like substances made from plants, grasses, and resins. The American Indians chewed resin made from the sap of spruce trees.

Modern chewing gum was first developed in the 1860s when chicle was brought from Mexico by the former President, General Antonio Lopez de Santa Anna, to New York, where he gave it to Thomas Adams for use as a rubber substitute. Chicle did not succeed as a replacement for rubber, but as a gum, which was cut into strips and marketed as Adams New York Chewing Gum in 1871.

Saliva is the most important component of oral health. Water comprises 99% of saliva and the remaining components are macromolecules, formed within the acinar cells and secreted into the mouth. Saliva alone is a powerful protector of the oral cavity. And, chewing gum is an efficient and pleasant way to increase saliva without drugs. Increasing saliva from the mouth is accomplished by the gustivatory action of gum and the mechanical action of chewing. Together these forces stimulate the salivary glands to increase the flow rate by about 10 times the resting state during the first few minutes of chewing and keep it significantly elevated for as long as you chew. Stimulated saliva is capable of maintaining a healthy mouth, correcting a potentially harmful environment using its high concentration of buffers, minerals and antibacterial components.

NIKOLA TESLA, A MAN WHO WAS AHEAD OF HIS TIME

A.E.Konoplyanchenko,IN-11
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Nikola Tesla (1856-1943) is a Serbian-American scientist, inventor, and electro and mechanical engineer who provided mankind with a large number of discoveries and inventions.

Tesla is most famous for conceiving the rotating magnetic field principle and then using it to invent the induction motor together with the accompanying alternating current long-distance long-electrical transmission system. His patents and theoretical work still form the basis for modern alternating current electric power (AC) systems including the polyphase power distribution system.

Tesla was so far ahead of his time that many of his ideas are only appearing today. His legacy can be seen in everything from the invention of the induction motor, long-distance long- electrical power distribution, Tesla coil and high-frequency electricity that led to the creation of neon and fluorescent lighting, basics of radio technology, remote control, wireless communication, lasers, the facsimile machine and hundreds of other devices that are now an essential part of our everyday lives. His inventions have changed the world around us.

A new city was built for the Chicago Worlds Fair, announced as “The World of Tomorrow”, with a complex of buildings and parks. A specially constructed machine hall contained 12 of Tesla’s two-phase generators, 1000 horsepower each, working at a frequency of 60 Hz. The generators produced electricity for the operation of devices and for electric lighting at the fair. This was the opportunity to spectacularly apply Tesla’s polyphase system.

Another significant invention, a Tesla coil, a type of resonant transformer circuit was invented by Nikola Tesla around 1891. It is used to produce high voltage and high frequency alternating current electricity. Tesla used these coils to conduct innovative experiments in: electrical lighting, phosphorescence x-ray generation, high frequency alternating current phenomena, electrotherapy, transmission of electrical energy wires.

Modern engineers and researchers still have a chance to go on with the ideas inherited from Nikola Tesla.

THE INVENTION OF PAPER

M.A. Lityuga, group IN - 12
A.M. Diadechko, E L Adviser

The invention of paper is one of the greatest achievements of mankind towards civilization. Paper has become an attribute of all spheres of our life.

In ancient times people searched for material that would serve them for writing.It is believed that the first production of paper is associated with the name of the Chinese dignitary Cai Lun and refers to the year 105 AD. But this is not the only version. During the archaeological excavations taken in the northern province of Shanxi in China in the middle of the last century, an ancient tomb was discovered. So, along with other interesting things, small pieces of paper were found inside it.

Papermaking process in the Middle Ages and later was considered particularly time consuming, demanding professionalism and experience. Requiring large amounts of water for production technology and in order to drive the mill, the shops and afterwards manufacturing plants were usually built on rivers. These workshops were called "paper mills."

For a very long time the main raw material that served for production of paper were rags. But with the development of printing and an increase in print runs of books, paper became more and more required. Calls do not throw old rags, though being attracting for rag collectors, did not bring the desired result. And then it was decided to try raw wood.

Surprisingly, the main fundamental techniques for papermaking have been preserved by now. Improvements have affected mainly mechanization and automation processes.

Today, the paper is considered to become a usual and affordable attribute. Production does not seem as difficult as in the old days. But even today the production of paper by hand can be observed, especially for luxury exclusive paper editions with engravings.It is hard to imagine how many uses paper finds today. But the most important use of paper still belongs to books.

THE SIGNIFICANCE OF THE AIR CONDITIONING IN OUR LIVES

S. Moskalenko, EM-01
A.M. Diadecko, ELA

Maintaining an optimal climatic conditions in apartments, houses, offices, cars, as well as cleaning indoor air of harmful particles - all these make an integral part of our life. For a modern man this comfort is a necessity and not a luxury. Otherwise life becomes unbearable. We are so accustomed to some of the modern facilities that can not even imagine how we got along without air conditioning before. Such benefit of civilization as air conditioning has quite closely incorporated into our daily lives.

History of a conditioner is the story of the company Carrier. One hundred and ten years ago, a talented inventor, a young scientist Willis Haviland Carrier created the first device to control the indoor temperature and humidity in the printing house. In 1906 he patented his "device for treating air". Now branded Carrier produced about 12% of the total number of air conditioners in the world. Today Carrier logo is on every eighth air conditioner.

Air conditioning is a device for cooling the indoor air. As an extra function it also provides heating. In fact it is the same refrigerator but turned inside out. Inside this device special substance (refrigerant) circulates and it is at the transition from one state (fluid) into another (gas) which tends to absorb heat (to take it from the heated air.) Refrigerant circulates through a system of tubes (cooling system) through which warm air is blown by an electric fan. The basic units of any air conditioner are: compressor, condenser, evaporator, thermal expansion valve and electric fans. Various manufacturers of these devices only make some improvements and completion, but the working principle remains the same. They may differ only in appearance and some features of the electronic control circuit, but to be absolutely similar in the arrangement and the air cooling system.

Air conditioners become an indispensable attribute in our lives. With new technology, we have highly functional filters which cope not only with the dust, but also with the smell.

WHERE DID JEANS COME FROM?

R.A. Ponomarenko, IN-11
A.M. Diadechko, ILA

Jeans are pants made of thick cotton fabric, usually in the color indigo. They are often equipped with studs at the joints seams pockets. Jeans were invented by Levi Strauss, who first sewed them as work clothes in 1853.

History of jeans such as we are accustomed to see them now is associated with the name of Leyba Strauss, a Belgian immigrant, Jewish by origin,. In 1853 he came to America being 24. He arrived by ship and while he was on board, American sailors called him Levi Strauss. Upon arrival in the United States Levy made a good use of a roll of canvas he had inherited from his father. In order to support the family, Strauss started making tents ordered by customers.

Once a prospector said to Levy that if he had sturdy pants, then they could spend the night under a tree, and not in a tent. Without thinking, Levi Strauss sent his first sewed pants made of canvas and sold them to worker. The price was 1 dollar and 20 cents.

In the same 1853, Levi Strauss opened his first workshop studio, in Battery Street, San Francisco, where he started tailoring pants for workers. Strauss traveled to miners' settlements offering products and gradually perfecting them in accordance with the wishes of customers. So there appeared loops on the pants belt, durable double stitching, deep front and back pockets. In 1860, the demand for products by Levi Strauss fell sharply. It was caused by the fact that the pants' pockets quickly broke away from gravity of gold nuggets and tools that workers used to carry. So there appeared the name of another person - Jacob Davis in the history of jeans . He invented a special device that allowed to strengthen his trouser pockets significantly.

In 1873 , Levi Strauss and Jacob Davis received a patent numbered 139121. They registered their patent and trademark in the United States for the production of "working strapless jumpsuit with pockets for knife, money and hours."

ZIPPER –A THING THAT KEEPS TOGETHER

A.N. Pryhodko, EP-11
A.M.Diadechko, ELA

It was a long way up for the humble zipper, the mechanical wonder that has kept so much in our lives 'together.' On its way up the zipper has passed through the hands of several dedicated inventors but none convinced the public to accept the zipper as a part of everyday costume. Later the magazine and fashion industry made the novel zipper a popular item as it is today, but it happened nearly eighty years after the zipper's first appearance.

Elias Howe, who invented the sewing machine, received a patent in 1851 for an 'Automatic, Continuous Clothing Closure. But Howe missed his chance to become a recognized “Father of the Zip” because of the success of the sewing machine.Forty-four years later, Mr. Whitcomb Judson marketed a 'Clasp Locker'- a device similar to the 1851 Howe patent. It came about because of his friend’s stiff back. The problem was that his friend could not do up his shoes. Judson came up with a slide fastener that could be opened or closed with one hand. On August 29, 1893, he patented his new “clasp locker”.

The design with an interlocking teeth we use today, was invented by Gideon Sundback. Only after he had remodeled Judson’s fastener into a more streamlined and reliable form, it was a success. The US Army was among its first customers.

The popular name 'zipper' came from the B. F. Goodrich Company, when they decided to use Gideon Sundback's fastener on a new type of rubber boots or galoshes and renamed the device the zipper.It took twenty more years to convince the fashion industry to seriously promote the novel closure on garments.Big boost for the zipper came when zippers could open on both ends, as on jackets, but the real success came when French fashion designers raved over zippers in men's trousers.

Today the zipper is everywhere, in clothing, luggage and leather goods and countless other objects. Thousands of zipper miles produced daily, meet the needs of consumers, thanks to the early efforts of the many famous zipper inventors.

YO-YO - THE SECOND OLDEST TOY

E.S.Shapovalova,IN-12
A.M.Diadechko,ELA

On the surface, the yo-yo is an incredibly simple toy, it is really nothing but a spool attached to a length of string. But in the right hands, it can be something extraordinary.

An accomplished yo-yoist can send the yo-yo flying out in all directions, make it hover in mid air, then snap it back into his or her palm. Ordinary string and wood (or plastic) are brought to life! This may seem like magic, but It is actually just physics at work.

The yo-yo in its simplest form is an object consisting of an axle connected to two disks, and a length of string looped around the axle, similar to a slender spool.

The yo-yo has enjoyed many periods of popularity throughout world history and may be the second oldest toy in the world (after dolls). There are ancient Greek yo-yos made of terra cotta in museums in Athens, and yo-yos are pictured on the walls of Egyptian temples. Next historical mention of the yo-yo was found in India in 1765. It was a small box with a picture girl in a red dress playing with a yo-yo. After 25 years of yo-yo came to Europe, it was available only to upper classes of Scotland, France and England. During this time, it has acquired many names and varieties. The Yo-Yo is known to have been popular with such important warriors as Napoleon and the Duke of Wellington. First patented in 1866 by James L. Haven and Charles Hettrich, the Yo-Yo has enjoyed periods of popularity for generations with kids.

First invented in ancient Greece, yo-yoing turns popular secondly in the 1920s and remains a popular pastime of many generations and cultures.

It is also difficult to say with certainty whether the toy spread from country to country. We do know that it is used as a toy around the world but throughout history is unmatched. And, although the yo-yo has gone through periods of hibernation in its trek through the ages, its popularity, just like the toy itself, always comes back.

TOP-10 ACCIDENTAL INVENTIONS THAT CHANGED THE WORLD

Gerasimenko P.M. IN-11
Diadechko A. M., ELA

1) Microwave(1945) was invented by Percy Spencer, an engineer and inventor who worked on the magnetrons - devices that allow to generate microwave signals required for the first radar. During the war, radar was an extremely important new invention, but with what microwaves can cook, was discovered purely by accident.

2) Penicillin(1928).A biologist Sir Alexander Fleming was researching the nature of staph bacteria. Once after returning from vacation, he noticed that one of the glass culture dishes he had accidentally removed, was covered with mold, and he threw it away. Later he noticed that staph bacteria could no longer grow in the area surrounding the fungal mold.

3) Coca-Cola. Pharmacist John Pemberton was working on a cure for headaches. He mixed a few ingredients - coca leaves, cola nuts, tropical tree and some other ingredients. The result was a syrup with an unusual flavor, which began selling in the nearby pharmacy, and then turned into the most popular drink in the world.

4) SuperGlue appeared in 1942, when Dr. Harry Coover tried to allocate clear plastic for the production of high-precision scopes handguns. For a time he worked with chemicals known as cyanoacrylates, which he soon found polymerized in contact with moisture, causing all the test materials from sticking.

5) Slinky. An engineer Richard James, who once remarked in 1940 that when the spring fell, it jumped some time on the floor and rolled over, and then calmed down. After several prototypes, in 1948 a new invention was presented at Slinky toy stores, making it one of the most popular and emblematic toys of all time.

6) Reinforced concrete. A French gardener Joseph Monier was nearly ruined when selling palm trees on the road, he beat clay pots, and plants died. The idea came to make a tub of cement, and for strength still frame of iron rods were used. Thus concrete was invented . There was no place for palms. Ten years later Monier

patented concrete sleepers, and even later – concrete for beams, bridges and what not.

7) LEGO. Due to financial crisis in the 30s of the 20th century a Danish carpenter Ole Christiansen nearly went around the world. People were not up ladders, on which he once stood in all senses. But the constructor for children that Christiansen fashioned, suddenly became in demand. Shortly the carpenter founded a company to produce Lego designers. This first famous toy was made of wood because the carpenter then just wanted to sell the remains of wood, it was more than anything and was not! A plastic Lego began only in 1947.

8) Safety glass. A French chemist Edouard Benedictus was too lazy to change the broken window. He was too lazy to wash test tubes and flasks. One such vessel has been dropped and crashed ...! What appeared to be in the flask was dissolved by ethylen, ethanol, and nitrates. The liquid evaporated and a thin layer of solution was left on the walls. Incidentally, Volvo has adopted this invention of Benedictus in 1944.

9) Ice lolly (popsicle). Frank Epperson, the author of this invention was a young guy, only 11 years old when he came up with what would later be called one of the most important inventions of the XX century. Of course, most likely Lady Luck smiled at the boy, when he dissolved the soda powder in the water - a popular drink among kids in 1905 . Drink did not happen immediately , and Frank , not removing the rod for stirring a drink from the glass, put it down for a while . The mixture was frozen . Frank laughingly showed his classmates ridiculous contraption frozen on the stick that could be licked with a tongue. 18 years later , Frank remembered this funny story and began producing popsicles "Epsicles" in 7 tastes.

10) Matches. mixing chemicals. On one day in 1826, John Walker noticed a dried lump of chemicals on one of his wooden instruments and tried to scrape it off. In response it produced sparks and flame. John Walker called his invention " friction lights " and sold them at the pharmacy in the boxes provided with sandpaper for fire excision.

ACCIDENTAL INVENTION OF VELCRO

K.S. Gorbatyuk, IN-02
A.M. Diadechko, ELA

What is necessary for invention? Inventions require months or even years of research and experiments. However, history is replete with cases of casual inventions, which have brought huge benefits to mankind.

One of such inventions is Velcro fastener. Original name of this invention comes from the French word Velcro which means agrimony. In English-speaking countries this invention is called - Hook & Loop.

Velcro idea appeared in 1941, when Swiss inventor George de Mestral was walking his dog. After returning home, he noticed that his coat and all dog hair were covered with thistles. Nosy Swiss decided to find out how this plant so strongly clings to wool. After researching the burdock under the microscope, it was found that the reason - the tiny hooks that agrimony was attached to wool tightly. Guided by the discovered property, George de Mestral created two tapes. On the first tape there were small hooks like hooks of burdock, and on the second - nap of wool. This is how the alternative fastener appeared!

After 14 years after its invention, Velcro fastener has gained recognition in many areas of industry. Velcro fastener has several advantages: possibility of making any form of fastener, compact size, flexible structure that allows this type of connection for all types of fabric and leather, absence of metal and plastic parts, which reduces its price, invisibility of fastener, speed of connection and disconnection, water resistance and durability.

Now almost all children's shoes and clothing produced with this type of fastener. In addition, the Velcro fastener is an essential feature of military clothing and space suits, which is another proof of its great convenience and practicality of use.

That’s how accidental invention may change the life of the inventor and all mankind.

AN ELECTRIC GUITAR AS A SMALL ORCHESTRA

A.B. Diedova, IN-01
A.M. Diadechko, ELA

I cannot imagine my life without my electric guitar. It is not a thing. It is an extension of myself. It is who I am.

Today not many people can tell about creation of this instrument. An electric guitar is a guitar that uses a pickup to convert the vibration of its strings into electrical impulses. Some of the earliest electric guitars adapted hollow bodied acoustic instruments and used tungsten pickups. The first electrically amplified guitar was designed in 1931 by George Beauchamp. George Beauchamp was born in Coleman County, Texas. Beauchamp performed in vaudeville, playing the violin and the lap steel guitar, before he settled in Los Angeles, California. During the 1920s, he experimented with the creation of electric lap steel guitars, electric guitars, electric bass guitars, electric violins, and instrument amplifiers. In 1931 he joined Adolph Rickenbacker to produce and sell electrified string instruments. Rickenbacker offered a cast aluminum electric steel guitar, nicknamed "The Frying Pan" or "The Pancake Guitar". It turned out that the sound defect can generate an infinite number of previously unknown sounds.

And here is the main question. How does it work? It is all because of pickups. Pickups are magnetic pieces set on the guitar's body — typically between the bottom of the fretboard and the bridge — that pick up the vibrations of the strings. Pickups contain electro-magnets that produce magnetic fields in their surroundings. Whenever the strings of the guitar vibrate, those vibrations are "felt" by the magnetic fields. The vibrations, in simple terms the notes played, are converted into electrical sound signals further sent to an amplifier.

Andre Segovia once said about the guitar as a living thing: "The guitar is a small orchestra. It is polyphonic. Every string is a different color, a different voice." Many of the guitar players agree completely with these words.

THE INVENTION OF THE PENCIL

A.I.Didorenko , IT-02
A.M.Diadechko, ELA

A pencil is a graphite stick and clay combination, sometimes with a colour pigment, encased mostly in a wooden cylindrical container. A pencil has two main parts: the “lead” which is a working part of the pencil and the “jacket” which surrounds it. The lead was originally made from a metal element which is called ‘lead’ in England. The metal lead is poisonous and it does not make such good marks as graphite. That is why people started to use graphite instead of lead. The jacket of a pencil is usually made of wood.

The history of a pencil can be traced to 16th century England, somewhere around 1564. Locals of Seathwaite village, in the north-west county of Cumbria, near Borrowdale, discovered a huge graphite deposit near their sleepy hamlet. Later on, they learned that the hard and compact material could be used to mark their cattle or sheep, in order to distinguish and keep an exact count of the same. This was the first invented pencil form. The natives also figured out how to shape the graphite into small sticks, for ease of use. Since the new substance was soft and delicate when thinned for use, there was a need for a support wrapping or casing for the graphite stick.

Initially, sheep skin or string was used to hold the substance together. The idea of a wood case for the graphite stick was first developed by an Italian couple. They thought of using carpentered juniper wood, made hollow, inserted with the core, and finally compacted in an oval shape. This was the first, crude form of the pencil we know today. The idea of using wood as the casing for the writing material soon began to gain ground. In an improved version, different types of wood were used to carve two halves into which the graphite stick was inserted, which were then glued together to make a strong and simple enclosure. This method continues to be used even today.

INVENTIONS THAT WE FORGOT TO PATENT

M.I.Zhyzha, EM - 01
A.M.Diadechko, ELA

We all know about the amazing world of discoveries and discoverers. Some of them were invented by our compatriots, others were made by foreigners. But there are cases when foreign scientists patented inventions that were earlier made by our home scientists.

In 1751 Leonti Shamshurenkov, a skilled mechanic, produced his " fluent stroller " which moved without any outside force. Shamshurenkov got fifty rubles for this order. The subsequent fate of strollers is unknown for historians . 18 years later , in 1769 , a Frenchman Nicolas Cuno presented the same device to the world. Unfortunately, all the world knows a Frenchman Cuno and our designer was forgotten!

Russia's first two-cylinder vacuum steam engine, simply locomotive, was designed by a mechanic Ivan Polzunov in 1763.In one year the machine was tested in Barnaul , attended by James Watt . He really liked the idea of that type of machine.In April 1784 in London, he was able to obtain a patent for a steam engine with a universal motor . The Member of Committee considered James Watt as its inventor

The phrase "Woke - plaster "was perfectly illustrated by medical practice of Nikolai Pirogov. In 1850 this great surgeon began to operate on the wounded from the ethereal anesthesia in the field for the first time in the history of medicine. Totally Pirogov spent about 10,000 operations under ether anesthesia . He was the first Russian medical man who began using plaster for the treatment of fractures.

In 1801, at Nizhniy Tagil factory, an inventor Efim Artamonov built the first all-metal two-wheeled pedal scooter, which

was later called the bike. Then , in 1818 the patent for this invention was issued to a German baron Karl Draize !

In 1860 the great Russian mathematician Paphnutiy Chebyshev did improbable: he calculated and developed a " walking straight design mechanisms without wheelsets from the principle of step." The device was named plantigrade machine . This car with full confidence can be considered a grandmother of the current Japanese robots!

The chronicle of Russian radio history is as follows: on May 7, 1895 , Alexander Popov for the first time publicly demonstrated transmission and reception of radio signals from a distance. In 1896 the world's first wireless message was passed. And in 1897 the possibility of radar using wireless was established. However, in Europe and America it is considered that the radio was invented by an Italian Guglielmo Marconi in the same 1895. Today it is very hard to prove the opposite!

The device, known as the " Edison's light bulb ," can be considered as nothing more than an improved invention by Alexander Lodygin . In 1870 this member of the Russian Technical Society proposed to use the tungsten filaments and spinning the filament in a spiral shape in the lamps . Thomas Edison did so only in 1879 that did not prevent him to get a patent on the bulb. Lots of people in the world associate the bulb with the name of Edison and they never heard of Lodygin.

MODERN POSIBILITIES OF Wi-Fi

V.S.Kliuiev, IT-02
A.M.Diadechko, ELA

Wi-Fi, also spelled Wifi or WiFi, is a popular technology that allows an electronic device to exchange data or connect to the internet wirelessly using radio waves. The Wi-Fi Alliance defines Wi-Fi as any "wireless local area network (WLAN) products that are based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards".

802.11 technology has its origins in a 1985 ruling by the US Federal Communications Commission that released the ISM band for unlicensed use. In 1991, NCR Corporation with AT&T Corporation invented the precursor to 802.11 intended for use in cashier systems. The first wireless products were under the name WaveLAN.

To connect to a Wi-Fi LAN, a computer has to be equipped with a wireless network interface controller. The combination of computer and interface controller is called a *station*. All stations share a single radio frequency communication channel. Transmissions on this channel are received by all stations within the range.

Wi-Fi allows cheaper deployment of local area networks (LANs). Also spaces where cables cannot be run, such as outdoor areas and historical buildings, can host wireless LANs. Manufacturers are building wireless network adapters into most laptops. The price of chipsets for Wi-Fi continues to drop, making it an economical networking option included in even more devices. Different competitive brands of access points and client network-interfaces can inter-operate at a basic level of service. Products designated as "Wi-Fi Certified" by the Wi-Fi Alliance are backwards compatible. Unlike mobile phones, any standard Wi-Fi device will work anywhere in the world.

BUNGEE JUMPING-TECHNOLOGY FOR THE BRAVEST

A. V. Kolesova, IN-02
A.M. Diadechko, ELA

Bungee jumping is an activity that involves jumping from a tall structure while connected to a large elastic cord. The tall structure is usually a fixed object, such as a building, bridge or crane; but it is also possible to jump from a movable object, such as a hot-air-balloon or helicopter, that has the ability to hover above the ground. The thrill comes from the free-falling and the rebound. When the person jumps, the cord stretches and the jumper flies upwards again as the cord recoils, and continues to oscillate up and down until all the kinetic energy is dissipated.

The word "bungee" originates from West Country dialect of English language, meaning "Anything thick and squat", as defined by James Jennings in his book "Observations of Some of the Dialects in The West of England" published 1825. Around 1930, the name became used for a rubber eraser. The word bungy, as used by A J Hackett, is "Kiwi slang for an Elastic Strap". Cloth-covered rubber cords with hooks on the ends have been available for decades under the generic name bungy cords.

The elastic rope first used in bungee jumping, and still used by many commercial operators, is a factory-produced braided shock cord. It consists of many latex strands enclosed in a tough outer cover. The outer cover may be applied when the latex is pre-stressed, so that the cord's resistance to extension is already significant at the cord's natural length. This gives a harder, sharper bounce. The braided cover also provides significant durability benefits. Other operators, including A. J. Hackett and most southern-hemisphere operators, use unbraided cords with exposed latex strands. These give a softer, longer bounce and can be home-produced.

There may be a certain elegance in using only a simple ankle attachment, but accidents where participants became detached led many commercial operators to use a body harness, if only as a backup for an ankle attachment. Body harnesses generally derive from climbing equipment rather than parachute equipment.

HIGH-SPEED RAILWAY LINES

S.O.Pylypenko, AM-01
A.M.Diadechko, ELA

Japan was the first country that built railway lines for high speed travel. Because of the mountainous terrain, the existing network consisted of 1,067 mm (3 ft 6 in) narrow gauge lines, which took indirect routes and could not be adapted to higher speeds. Consequently, Japan had a greater need for new high speed lines than countries where the existing standard gauge or broad gauge rail system had more upgrade potential.

The Shinkansen is a network of high-speed railway lines in Japan operated by four Japan Railways Group companies. The network presently links most major cities on the islands of Honshu and Kyushu, with construction of a link to the northern island of Hokkaido underway.

The middle speed is 320 km/h (200 mph). Test runs have reached 443 km/h (275 mph) for conventional rail in 1996, and up to a world record 581 km/h (361 mph) for Maglev train sets in 2003.

Shinkansen literally means new trunk line, referring to the high-speed rail line network. The name Superexpress, initially used for Hikari trains, was retired in 1972 but is still used in English-language announcements and signage.

The Shinkansen is the world's busiest high-speed rail line.In 2008 it was carrying 151 million passengers per year . Though largely a long-distance transport system, the Shinkansen also serves commuters who travel to work in metropolitan areas from outlying cities. Japan's Shinkansen network had the highest annual passenger ridership (a maximum of 353 million in 2007) of any high-speed railnetwork until 2011, when China's high speed rail network surpassed it at 370 million passengers annually.

Railways are using Shinkansen technology not only in Japan. The countries also using this technology are Taiwan, China, United Kingdom, Brazil, United States, Canada, Vietnam and India.

Trains can be up to sixteen cars long, with each car measuring 82 ft in length. The longest trains are 400 m (1/4 mile).

LIFE-CHANGING INVENTIONS

M.Solovey, IN-12
A.M.Diadechko,ELA

No doubt many of mankind's greatest inventions required years of patience, skill, frustration and research. But not all of them. Actually, quite a few of the things you use every day were created by accident.

During World War II, when navy engineer Richard James was trying to figure out a way to employ springs aboard navy ships to keep sensitive instruments from bouncing around, he accidentally dropped one of them and continued to "walk" away. The idea to make a children's toy out of the wandering spring came to him almost immediately, and in 1945 his first Slinky was complete. Within 50 years, James Industries sold more than a quarter of a billion Slinkys worldwide and the slinking toy is still finding its way into American pop culture. The Slinky has found other uses, including as an antenna by soldiers in Vietnam and as a therapy tool. The Slinky jingle is the longest-running song in advertisement history. It first aired in 1962.

In 1853 George Crum, a chef in New York, accidentally invented potato chips when an annoying patron kept sending his french fried potatoes back to the kitchen because they were soggy. In an attempt to teach the customer a lesson, Crum sliced them extra thin, fried them to a crisp and drowned them in salt. To his surprise, the complaining customer actually like them and “Saratoga Chips” became a hit across New England.

In 1968, while trying to come up with a extra strong adhesive at the 3M company, scientist Spencer Silver managed to create just the opposite: a very weak adhesive that would peel off when removed from any surface. No one thought there was any use for such a product, until another scientist, Art Fry, realized that the little pieces of paper made great book marks for his church songs without leaving residue on the page.

It was 1905 and soda pop had just become the most popular drink on the market. 11 year old Frank Epperson decided he wanted to try saving some money by making his own at home. Using a combination of powder and water he got pretty close but then absentmindedly left the concoction out on the porch all night.

Temperatures ended up dropping severely and when he came out in the morning he found his mixture frozen with the stirring stick still in it.

ANKLE MONITORS FOR OFFENDERS‘ CONTRL

A.V.Semenova, YU-05
A.M.Diadechko, ELA

An ankle monitor is a device that is required to be worn by offenders under house arrest. Some states may offer house arrest to offenders convicted of less serious crimes.

The ankle monitor is an electronic device which sends a radio frequency signal containing location and other information to a receiver. The device cannot be easily removed. Any tampering with the device can often trigger an alarm. If an offender moves outside of an allowed range, the police will be notified.

Electronic monitoring was originally developed by a small group of researchers at Harvard University in the 1960s, headed by R. Kirkland Schwitzgebel and his twin brother, Robert Schwitzgebel. In 1983, Judge Jack Love in Albuquerque, New Mexico, inspired by a Spider-Man comic strip, initiated the first judicially sanctioned program using monitoring devices. These were produced by Michael T. Goss, a former Honeywell computer sales representative. Shortly thereafter, programs began in Florida using a cuff invented by Thomas Moody.

Within six years, at least 16 manufacturers were listed in the Journal of Offender Monitoring. In 2006, as estimated, 130,000 units were deployed daily in the United States. They also gained popularity in the United Kingdom, but adoption in the rest of the EU was a little slower. A collection of early equipment and a written summary, with photographs of the history of commercial devices in the United States is housed at the Archives of the History of American Psychology, University of Akron, Akron, Ohio, USA.

In most cases, an ankle monitor system consists of three main components: an ankle bracelet, an on-site receiver, and a remote receiver. When tethered around the ankle, the bracelet unit takes regular or constant readings of desired information, such as the user’s location. Using either radio transmission or GPS technology, these

readings are sent to an on-site transmitter, usually located in the user's home. Next, the readings are relayed to a remote receiver, which may be located at a police station or monitoring service center. If the readings indicate a breach by the user, such as leaving the home while under house arrest, the proper authorities are alerted and act accordingly.

There are many kinds of an ankle monitor:

Alcohol monitoring is an effective technology for offenders with alcohol-related crimes (driving while intoxicated, habitual traffic offenses).

Drug Court utilizes electronic monitoring as an alternative to jail for offenders who are in the Drug Court Program in Denver District court.

Juvenile monitoring program works with juveniles, their parents/guardians, and probation officers to address specific needs to promote successful completion of electronic monitoring sentences. The program uses a variety of technologies to monitor juvenile offenders.

Post-conviction cases are the largest of the programs administered by the Electronic Monitoring Program, accounting for 57% of offenders monitored. The Courts utilize this program as an alternative sentence to jail and/or a condition of probation. The offender is required to meet with a probation officer either weekly or bi-weekly to address issues, verify employment, treatment, community service, school, and other court approved activities.

The effectiveness of monitoring in reducing crime is uncertain, especially as most people who violate parole are not committing crimes. It is thought that the monitoring may serve as a deterrent to criminal behavior; however, a thorough and comprehensive review of research literature has indicated that, over a period of three years, monitoring did not reduce crime more than other prison diversion programs.

The inventors, Kirkland and Robert Gable, who are now emeritus Professors of Psychology at California Lutheran University and the Claremont Graduate University, have been strongly advocating the use of positive incentives in monitoring programs.

HARD DRIVE DISK AND MEMORY STORAGE

Y.V.Ushakov, IT-02
V.S.Trubayev, IT-01
A.M.Diadechko, ELA

Evolution of methods of memory storage has gone a long way from cave paintings to the hard drives, which we successfully use today. History of hard disk drives began in 1956 and continues to this day. This invention has been a great breakthrough in the development of IT technology.

Today this device received the propagation of the name –

" Winchester" . In one version the hard drive got it thanks to the work of Kenneth Haughton, a project manager in IBM. It resulted in 1973 when the hard drive model 3340 was released. For the first time one-piece platter and the read heads were united in one body. The design engineers used for it a short internal name " 30-30 " , which meant that there were two modules with 30 megabytes each, consonance coincided with the designation of the popular hunting weapons rifles Winchester Model 1894 , which used a 30-30 rifle cartridge .

As for " Winchesters " , they use aluminium drives and consist of three blocks of details. The first block usually consists of several disks made of metal or glass. The second unit consist of mechanical hard drive, which rotationally drives the entire disk array, as well as precise positioning of the reading heads . The third block consists of electronic parts: chips , chips that process data , correct the errors and run mechanics.

The basic function of the device is the storage of memory. Today, modern hard drives can store up to 20 terabytes of memory, unlike their predecessors, which had two modules with a volume of 30 megabytes. That is enough to store approximately 10,485,760 books , or 69,905,066 images, or 4096 movies in FULL HD. But we must remember the Moore's law: every year the amount of information doubles.

INVENTION OF CONTACT LENSES

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Contact lenses is a great invention which is intended for people with a sight problem. They have changed the lives of millions of people around the world. It was estimated that 125 million people (2%) used contact lenses in 2004. A contact lens is a thin lens placed directly on the surface of the eye and it is considered a medical device and may be worn to correct vision or for cosmetic or therapeutic reasons. They might seem like a new, modern invention, but the idea has actually been around for hundreds of years. So, the history of contact lenses development is long and rich.

Artist and inventor Leonardo da Vinci sketched a concept for improving vision with a contact lens in 1508 and he is considered the first inventor of contact lenses. But in his Codex of the Eye, he described the principles of a contact lens without describing something we would actually recognize as a contact lens as a method to directly modify the corneal power by submerging in water.

More than a century later, in 1636, Rene Descartes, proposed another idea, in which a glass tube filled with liquid was attached to the eye. This was hardly a contact lens, but again the principle of corneal neutralization was clear.

In 1801 Thomas Young made a basic pair of contact lenses on the basis of the Rene Descartes' model. He used wax to affix water-filled lenses to his eye. This neutralized his own refractive power. He then corrected for it with another pair of lenses.

The first written description of a device approximating a contact lens is believed to date to 1823. Sir John Herschel, an English astronomer, proposed "some transparent animal jelly contained in a spherical capsule of glass applied to the surface of the eye" to correct irregular astigmatism. He also suggested that a mold of the cornea might be taken and impressed on some transparent medium. He thought it possible that "a temporary distinct vision" might be obtained through one of these methods, but it is not known whether Herschel ever tried to put his ideas into practice.

But only in 1887 the first contact lenses were actually developed be the German physiologist and ophthalmologist, Eugene Adolph Fick. He first tried his lens out on animals. These lenses were made from blown glasses or ground and polished glass, and were primarily sclera designs that covered much of the eye. Although they were effective, the wearer could only tolerate them for a few hours because of their weight. Nevertheless, the improvement on visual acuity that a piece of glass on the eye could provide was encouraging.

In 1889, a German glassblower named F.A. Muller improved upon the glass lens by making it thinner and lighter. Then in 1929, a Hungarian physician named Joseph Dallos perfected a method of taking molds from living eyes so that lenses could be made to more closely conform to the ocular curvatures.

Contact lenses as we know them today, were developed in 1936 by a New York optometrist William Feinbloom, fabricated the first American made contact lenses and introduced the use of plastic lenses.

In 1948, a California optician Kevin Tuohy began making contact lenses entirely of plastic. They were still bigger than the cornea, but smaller than previous lenses.

The soft contact lenses were invented by Otto Wichterle in 1961. This Czech chemist has developed the first hydrogel to produce contact lenses really comfortable. And this soft, hydrophilic (water absorbing) plastic now is known as polymacon. These lenses allow the oxygen to reach the eye even when the user is wearing them.

In 1998, an important development was the launch of the first silicone hydrogels onto the market by Ciba Vision in Mexico.

Technology continues to improve making the contact lens more exciting than ever before. Many people still do not like the idea of putting a little piece of film into their eyes. They believe contacts will be uncomfortable and cause all sorts of eye irritations. Although this may have been true in the beginning, it is no longer the case. Today's contact lenses are very comfortable. New users find that within minutes they can't even feel that they have them in at all.

THE HISTORY OF THE BICYCLE

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Transport plays an important role in everyone's life. We can travel long distances in a short time interval with cars, airplanes, trains, ships. Each of these modes has its advantages and disadvantages. One drawback is the emission of carbon dioxide, which negatively affects the environment. So the bicycle is selected as an alternative means of transportation. A bicycle is transport propelled by human muscular force through the foot pedals.

"Machine Run" by Carl von Zauerbrona is the prototype bike, which was invented in 1818. This invention was a wooden frame and had no pedals. In 1863 Pierre Lalman built the first "dandy horse" with rotating pedals in his workshop in Paris. The next year the brothers Olivier began mass production of "horses dandy" with pedals in cooperation with the coach-affairs master Pierre Michaud. The last was the first who thought of replacing the wooden frame on a metal bike. In 1866 Pierre Lalman received the first patent for an invention. In 1884 Englishman John Kemp Starley created a new model of bike - rovér. In 1878 inventors made the first folding bike, in 1890 the frame became aluminum. In 1888 the vehicle was supplied with inflatable rubber tires. It was invention by John Boyd Dunlop. In 1898 the braking problem was solved. People began to use the brake pedal. By the early twentieth century there were mechanisms of switching of speeds. However, those systems were completely uncomfortable and unpopular. The modern mechanism was invented in 1950 by Italian cyclist Tullio Campagnolo. At the end of the twentieth century American inventors designed special bikes for racing and mountain biking that are known to us today.

Now there are different kinds of bikes including road, mountain, hybrid, tourist, Fat-bike, folding, BMX, track and others. Each type of bike has its own characteristics. Wrong choice of bike can lead to problems with health. So get exercise, lead an active lifestyle and be healthy, beautiful and happy. Take a popular saying " healthy body, healthy mind" really seriously.

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Наукове видання

ЖИТИ У БЕЗПЕЧНОМУ СВІТІ

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TO LIVE IN A SAFER WORLD

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