Ministry of Education and Science of Ukraine
Zhytomyr State Technological University
Ivan Franko Zhytomyr State University
Zhytomyr National Agroecological University
Zhytomyr Nursing Institute

“Current Trends in Young Scientists’ Research”

All Ukrainian Scientific and Practical Conference

Book of Papers

April 14, 2016

Zhytomyr

All Ukrainian Scientific and Practical Conference

"Current Trends in Young Scientists' Research"

Organizing Committee

Chair:

Viktor Yevdokymov, D. Ec., Professor, Rector of Zhytomyr State Technological University

Co-Chairs:

Oksana Oliinyk, D. Ec., Professor, 1st Vice-Rector, Zhytomyr State Technological University

Volodymyr Kotenko, PhD in Engineering, Associate Professor, Dean of the Faculty of Mining and Ecology

Andrii Morozov, PhD in Engineering, Associate Professor, Dean of the Faculty of Information Computer Technologies

Olena Denysiuk, PhD in Economics, Associate Professor, Dean of the Faculty of Economics and Management

Members of the committee:

Liudmyla Mohelnytska, PhD, Associate Professor, Head of Foreign Languages Department, Zhytomyr State Technological University

Natalia Andriichuk, PhD, Associate Professor, Head of Foreign Languages Department, Zhytomyr State University named after Ivan Franko

Natalia Shyhonska, PhD, Associate Professor, Head of Academic Laboratory, Zhytomyr Nursing Institute

Halyna Khant, PhD, Associate Professor, Head of Foreign Languages Department, Zhytomyr National Agroecological University

Natalia Kurnosova, PhD, Associate Professor, Foreign Languages Department, Zhytomyr State Technological University

Svitlana Kobzar, Senior Teacher of English, Foreign Languages Department

Svitlana Sukhovetska, Senior Teacher of English, Foreign Languages Department

Svitlana Kuriata, Senior Teacher of German, Foreign Languages Department

Valentyna Shadura, Senior Teacher of English, Foreign Languages Department

Liudmyla Fursova, Senior Teacher of English, Foreign Languages Department

Natalia Krushynska, Teacher of English, Foreign Languages Department

Iryna Melnychenko, Teacher of English, Foreign Languages Department

Tetiana Staiulik, Teacher of French, Foreign Languages Department

Liudmyla Otdelnova, Chief Engineer, Foreign Languages Department

Ministry of Education and Science of Ukraine
Zhytomyr State Technological University
Ivan Franko Zhytomyr State University
Zhytomyr National Agroecological University
Zhytomyr Nursing Institute

All Ukrainian Scientific and Practical Conference

"Current Trends in Young Scientists' Research"

Book of Papers

April 14, 2016

Друкується за рішенням
Вченої ради Житомирського
державного технологічного
університету
(протокол № 7 від 29.02.2016 р.)

Zhytomyr
2016

УДК 811.111
ББК 81.2 (4 АНГЛ.)

Current Trends in Young Scientists' Research. All Ukrainian Scientific and Practical Conference (April 14, 2016) – Zhytomyr : ZSTU, 2016. – 226 p.

ISBN 978-966-683-459

The collection includes conference abstracts of the reports made at All Ukrainian Scientific and Practical Conference "Current Trends in Young Scientists' Research", that took place at Zhytomyr State Technological University on April 14, 2016. Participants from higher educational institutions of Zhytomyr, Berdychiv, Kamianets-Podilsky, Kyiv, Lviv and Rivne took part in the work of the Conference. The reports presented at the Conference deal with a wide range of research problems in the spheres of mechanical engineering, transport, mining, ecology, information-computer technologies, economics, medical science and humanities. The publication is aimed at researchers, students, masters, post-graduate students.

УДК 811.111
ББК 81.2 (4 Англ.)

All Ukrainian Scientific and Practical Conference

"Current Trends in Young Scientists' Research"

April 14, 2016

Редактор: Могельницька Л.Ф.
Комп'ютерний набір та верстка: Отдєльнова Л.Л.
Макетування: Отдєльнова Л.Л.

Формат 60x84/16. Гарнітура Times New Roman.
Ум. друк. арк.13,14.

Видавець і виготовлювач
Житомирський державний технологічний університет
вул. Черняховського 103, м. Житомир, 10005

Свідоцтво про внесення до Державного реєстру суб'єктів
Видавничої справи ЖТ № 08 від 26.03.2004 р.

ISBN 978-966-683-459

CONTENTS

Session work №1

CURRENT RESEARCH IN THE FIELD OF ENGINEERING SCIENCES

UDC 629.13

O. Bahinskyi, Master student
A. Tarazanov, Master student
V. Rudzinskyi, D.of Engr., Prof., research adviser
V. Shumlyakivskyi, Senior Lecturer
I. Melnychenko, lecturer, language advisor
Zhytomyr State Technological University

ONLINE MONITORING SYSTEM OF TECHNICAL CONDITION AND AS A MEANS OF BUS LOAD MONITORING OF THE SAFETY OF PASSENGER TRAFFIC

Since 2013 the Sectoral program of ensuring the road safety has been carried out in Ukraine.

The aim of the Sectoral program is to improve situation in the sphere of road safety in Ukraine (especially in the performance of commercial road transportation), reduction in accident rate, the number of accidents and the severity of the consequences they lead to, ensuring the acceptable level of safety carriage of passengers and goods by road through the implementation of measures to improve the state road safety.

The Sectoral program aims at complex problem solving related to road safety, the priority of life and health of motoric public.

The main tasks of the Sectoral program in relation to the ensuring the technical condition and safety of the buses are:

- implementation of safety management systems in road transport traffic and prevent accident rate;
- ensuring the compliance with requirements of legislation on the mode of work and rest of drivers of transport vehicles.

Thereby we propose the expansion of the system of online monitoring of vehicles in order to increase the number of controlled parameters that affect the safety of passenger traffic (Fig. 1).

Axle load sensor with special installation scheme in the suspension elements provides a measurement of the load on each wheel. At the interaction with pressure and temperature sensor in the tires, the calculation of resistance motions and coupling

properties wheel engine is. These indicators together with indicators of temperature sensor of brake pads and automotive radar short-acting allow to determine the stopping distance interval security, stability and bus manageability that directly affects the safety of the bus in the transport stream.

The choice of automotive radar of short-acting is justified by speed limits and distance to previous vehicle in the transport stream.

Driver identification system and tachograph carry out the supervision of work and rest regimes of the driver of the vehicle. Driver identification system combined with a designed set allows estimating the professional skills of the driver in compliance with the rules of eco driving.

The data is processed with the help of the tracker and the computing module and provide information to the driver about driving a vehicle safety and is transmitted to the analytical center of road safety and passenger traffic by GSM communication channels where analyzed.

Wear and temperature sensor of brake pads allows to perform technical maintenance of brakes when reaching the limit roadworthiness that reduces the cost of maintenance and operation of the bus.

Information driver monitor can display the load of passenger compartment relatively to the passport load, the effectiveness of the brakes and approaching temperatures of brake mechanism to critical point.

Automotive radar added to the system allows calculating the recommended speed with the safety interval and displaying it on the driver monitor.

Analytical center may give the recommendations to the driver as to the speed for the prevention of deviation schedules including those when changing situation on the route.

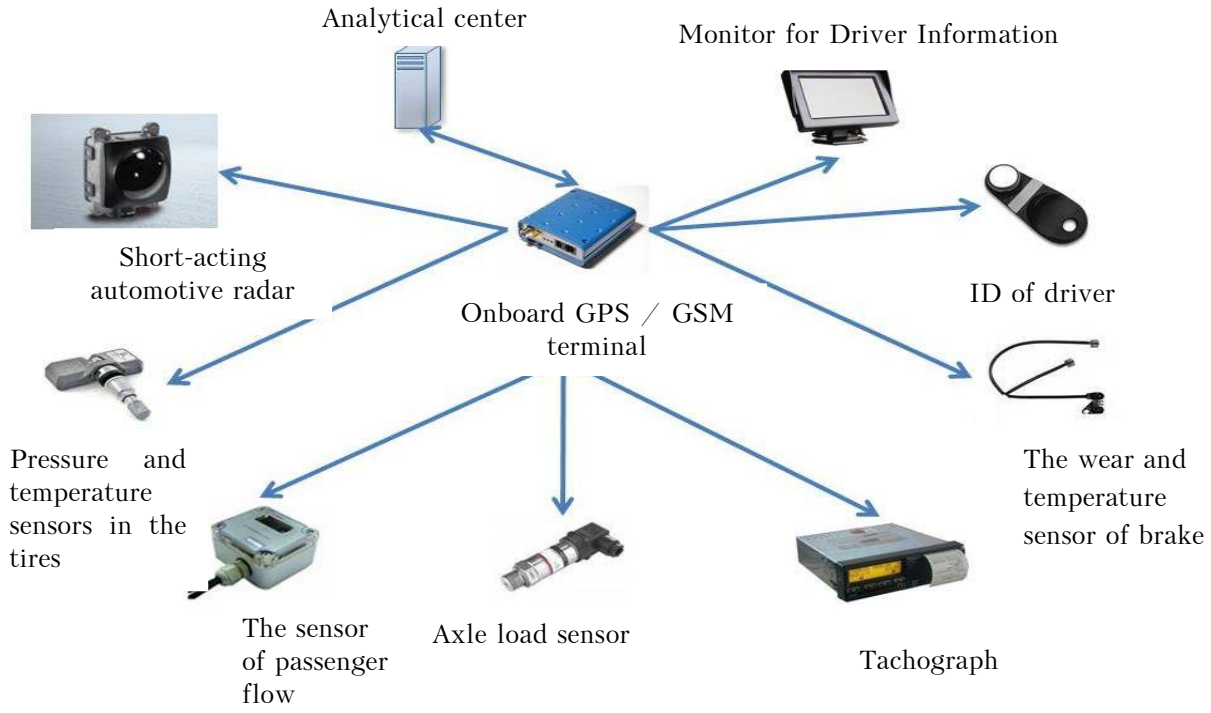


Fig. 1. Scheme of online monitoring system of wheeled passenger transport

Conclusion: Designed system of monitoring allows the driver to obtain information concerning the recommended speed with maintenance of safety interval in the transport stream for the actual technical condition and the bus load and prevent malfunctions of the braking system at runtime of passenger traffic.

UDC 72.03

P. Benediuk, M. Arch., postgraduate
O. Mykhaylyshyn, D. Arch., Prof., research advisor
National University of Water and Environmental Engineering

THE FORGOTTEN ARCHITECT SERHIY TYMOSHENKO: INVESTIGATION PROBLEMS

The research of the works of Ukrainian architects of the early 20th century has been started just after the war, however one of the comprehensive researches has been held in 1986 by H.O. Lebedev, Associate Professor of Arts, describing the works of such architects as O. Verbytskii, O. Beketov, V. Trotsenko (one of the students of S. Tymoshenko), P. Alioshyn, artists Krychevski and many others, the name of Serhiy Tymoshenko has not been mentioned yet [7]. The first articles during the times prior to the war on the activity of the architect were fairly critical regarding the development of the "Ukrainian style" in the architecture. Serhiy Tymoshenko has been mentioned several times in the foreign articles later on [18, s. 195], although they did not disclose his contribution properly. The latter researches of the late 20th – early 21st centuries as well as the works of V. Chepelyk [17, s. 313-318; 18], followed by V. Vlasenko [1] depicted the life and works of S. Tymoshenko unknown before as the "father" of Ukrainian architectural modern of the early 20th century. Regardless the present-day interest of the contemporaries [1; 9; 12] to this architect, his name might be considered to be forgotten not by his small or insufficient creative achievements, but because of the significant loss of information and materials directly related to its architectural and socio-political activities. This article aims to reveal some aspects and problems of research and artistic heritage of S. Tymoshenko.

It is important to mention the beginning of his career by gaining the professional education having graduated from St. Petersburg University for Civil Engineers in 1907 [16, s. 5] among the famous general facts of biography of S. Timoshenko [6, s. 3206; 11]. Being a student S. Tymoshenko showed his great interest to Ukrainian folk architecture motives as the mean for the national identification in the professional environment, actively participating in the social life of the Ukrainian student community [17 s. 217-219]. Unfortunately, one failed to find his student project of that time. Having graduated the university, he focused on gaining the practical experience. He had the opportunity to realize his own architectural vision, obviously working both at the constructing of the railway hub in Kovel and in the local county council. S. Tymoshenko has mover to Kyiv in 1908,

working as the engineer at the Department for Machineries of the headquarters of the South-Western Railway Bureau as well as providing the works for the private orders.

One of the important elements of the research of works of S. Tymoshenko is the division into periods of his activity according to the places of residence and work experience that have changed during his entire life under various circumstances, including those of the social and political ground. The next period of his life is connected to the moving of S. Tymoshenko to Kharkiv alongside with his family. This time of his life work might be considered as the most fruitful, analyzing his activity as of 1909 until 1918. He has designed and implemented over a dozen od residential and non-residential premises in the city of Kharkiv [18], which archive projects remain lost; S. Tymoshenko implements about 40 (*calculated by the author*) constructions and buildings of the railway premises of Northern Donetsk and Kuban railway zones. They became possible to be identified by the explicit manner the author only as well as the brief memos at the archive institutions of Ukraine [4; 15]. The issue of loss of the materials of that time is hardly to be restored. All the materials connected to his workshop bureau alongside with the copies of the projects were seized after the rummage of Tymoshenko's house in 1921. Professor M. Sumtsov had managed to take back hardly anything as the witnesses recall. The found description of his activity of that time proves his high professional skills, impressive typological broadness of the object and kinds of works (urban premises, industrial, civic, residential and religious buildings, various technical solutions and engineering structures, railway constructions, small architectural forms etc.) and their stylistic originality [14; 15].

Serhiy Tymoshenko has moved to Lviv after 1922 and has started thereof the new period of his work architectural and civic activity. The exhibitions, organized by the Society for the Activists of Ukrainian Art in 1922, 1923 and 1924, performed over fifty architectural projects of various type [5p. 10-11; 13, p. 13], part of which were implemented, such as: churches in Levandivka, Klepariv districts, in the city of Lviv, in the town of Boryslav and in the village of Bronnyky. These projects are archived in Warsaw [19] and in the foundations of Andrey Sheptytskyi Lviv National Museum. However, the majority of the sketch projects and performed projects remain lost. This very Lviv period of his live, the architect has had all the available opportunities and favorable social and cultural circumstances to implement his ideas of the national identification in the architecture of Ukraine.

S. Tymoshenko resides in Czech Republic during 1923-1930, working for Ukrainian Economic Academy in Podebrady as the lecturer, the Professor later on, and as the President of Academy since 1927. The devotion of his research and development activity of that time has not ever impeded his architectural creative pursuits, which were positively influenced by providing the lectures on architecture and constructing art at the Academy and at the Studio for Plastic Art. The "archive of Prague" has an interesting fortune [8], part of which is located in the foundations of Central State Archive of Supreme Public Authorities and Government of Ukraine in Kyiv. Another part remained at Prague State Archive. S. Tymoshenko and his

researches come across the issues and challenges of that temporary emigration of the architect to Czech Republic and foreign language environment. However, the documents of 1930s make the evidence that S. Tymoshenko has managed to study and use Polish and German languages only [4, p. 21].

Having come back to Volyn region in February 1930, S. Tymoshenko has been appointed for the job of the Manager of Department for Construction at District Land Bureau in Lutsk [3, p. 107]. The major part of the documents and materials on his activity of this "Volyn" or "Polish" period is saved in the foundations of Volyn Region State Archive, however one might assume that plenty of them have been lost. Polish was the official language of all the public authorities, therefore S. Tymoshenko had to study Polish rapidly, what he mentions while the appointment to the new job as a public servant and obtains the Polish citizenship with his wife in November 18, 1929 [4, p. 12]. The next phase of the career of S. Tymoshenko in Volyn became the appointment for the job of referendo of Department for Construction at Volyn Voivodship Bureau until August 1935 [4, p. 91]. In 1935, he had been selected as the deputy to Polish Sejm, where he became the Head of Volyn Parliamentary Representation later on [2; 20]. Being the Ambassador, he starts the broad civic activity, while in 1938 he becomes the senator and is the member of supreme political elite of Rzeczpospolita [2; 21]. It hardly possible to research, study and evaluate his active architectural and civic political activity of this time without any skills of Polish because the very architectural projects and supporting documents are in Polish even. The new Polish architecture of that time has had a great impact on the architects in Volyn region, including S. Tymoshenko. We have a big possibility to observe the evolution of architectural and stylistic as well as the space planning solutions on the example of the certain architectural objects in the context of the modern tendencies of the architecture development of the interwar time [10].

One of the interesting but the least studied is the period of the postwar emigration of S. Tymoshenko to USA. The bad health conditions of the architect did not influence his creative activity. Hence, the churches in Vancouver, Toronto and Saskatoon were constructed according to his project. The materials and researches of this last period remain unstudied yet.

We can divide the following problems of S. Tymoshenko life works:

1) factors of territorial remoteness of the regions in different periods of life as his activity covers six countries (Russia, Ukraine, Czech Republic, Poland, the US and Canada); 2) fragmentation and integrity of archival materials and various archival institutions recorded a significant loss of project documentation, which is the basis of the study of architectural heritage of the architect; 3) Linguistic factors of various periods of activity (Ukrainian, Russian, Czech, Polish and English language environment); 4) typological breadth and stylistic differentiation of architectural objects, changing of the trends in style; 5) Inaccuracies and discrepancies of the facts in some already published works.

Despite the certain information gaps that eventually constantly filled up, the analysis of the lifework path of S. Tymoshenko at the various stages and different

periods shows him as the outstanding Ukrainian architect, artist, engineer, and social and political activist, the founder of four artistic architectural organizations in different periods and actively working in these organizations, which greatly contributed to the development of Ukrainian architecture in the early 20th century. He has gone a long path from European art to modern nationally oriented architecture in its various forms and options from the neoclassical eclecticism to the modernistic functional principles, but always with the understanding of tectonic aspects and bases of artistic imagery.

REFERENCES

1. Власенко В.М. Сергій Тимошенко – архітектор і політик // Сумський історико-архівний журнал. № II-III. 2007. – С. 29 – 37.
2. Давидюк Р. Архітектор у політиці: громадсько-політична діяльність Сергія Тимошенка в 30х роках ХХ століття // Волинські історичні записки : зб. наук. праць / ред. С. М. Міщук ; редкол. Л. В. Баженов [та ін.]. Житомир: Полісся, 2010. Т. 5. С. 228 – 235.
3. Державний архів волинської області. – Ф. 277. – Оп. 1. – Спр. 745
4. Державний архів волинської області. – Ф. 46. – Оп. 7. – Спр. 2457
5. Друга Українська мистецька виставка: Каталог // ГДУМ у Львові. – Львів, з друкарні наук. тов. ім. Шевченка, 1923. – Травень. №272-303
6. Енциклопедія Українознавства. – Львів, 2000. – Т.9.
7. Лебєдєв Г.О. Украинская архитектура 1920-х – начала 1930-х годов /основные тенденции развития/. Диссертация на соискание ученой степени кандидата искусствоведения, – Киев, 1968. – С. 297
8. Мага, І.М. "Празький архів" як сегмент архівної україніки (нотатки з презентації книги Т.Г. Боряк "Документальна спадщина української еміграції в Європі: празький архів (1945-2010)") [Текст] / І.М. Мага // Сумський історико-архівний журнал. - 2012. - №XVIII-XIX. – С. 155 – 161.
9. Матеріали всеукраїнського наукового семінару, до 130-річчя з дня народження С.П. Тимошенка // АСВ. Зб. наук. праць. Вип. 3. / За ред. П.А. Ричкова. – Рівне: ПП ДМ, 2012. – С. 241 – 309
10. Михайлишин О., Бенедюк П. Модерністичні тенденції у творчості С.П.Тимошенка «Волинського» періоду // АСВ. Зб. наук. праць. Вип. 3. / За ред. П.А. Ричкова. – Рівне: ПП ДМ, 2012. – С. 265 – 272
11. Професор Сергій Тимошенко // Українська Господарська Академія в Ч.С.Р. 1922-1935. - Нью-Йорк, 1959. – С. 67 – 68.
12. Руслана Давидюк. Архітектор у політиці: громадсько-політична діяльність Сергія Тимошенка в 30-х роках ХХ століття. Волинські історичні записки: Зб. наук. пр., Том 5, 2010 р. – С. 225 – 228.
13. Українська мистецька виставка: Каталог // ГДУМ у Львові. Львів, з друкарні наук. тов. ім. Шевченка, 1922. - Червень. - №264 – 286.
14. Центральний державний архів вищих органів влади та органів управління України. – Ф. 3795. – Оп. 1. – Спр. 581.
15. Центральний державний архів вищих органів влади та органів

управління України. – Ф. 3795. – Оп. 1. – Спр. 581(466). - Арк.36 – 41;

16. Центральный государственный исторический архив Санкт-Петербурга (ЦГИА СПб). Ф. 184, Оп. 3, Д. 3447 // Личное дело студента Тимошенко Сергея

17. Чепелик В.В. Українській архітектурний модерн / Упорядник З.В. Мойсеєнко-Чепелик – К.: КНУБА, 2000, – 378с.; іл.

18. Чепелик В. Архітектор С. Тимошенко, традиціоніст і новатор // Теорія та історія архітектури і містобудування: Зб. наук. праць Державного науково-дослідного інституту теорії та історії архітектури і містобудування.– Вип. 4. На честь Євгена Васильовича Тимановича.– К.: НДІТІАМ, 1999.– С. 195 – 210;

19. Archiwum Akt Nowych w Warszawie, MWRiOP, sygn.1186.

20. Brzoza Cz. Ukraińska reprezentacja parlamentarna w II Rzeczypospolitej // Krakowskie Zeszyty Ukrainoznawcze. Краківські українознавчі зошити. – T.I-II. – 1992–1993. - Kraków, 1993. – S. 165;

21. Kto był kim w II RP, 1994, s. 556 (fot., oprac. J. Łaptos, A. Mania); M. Czajka, M. Kamler, W. Sienkiewicz, Leksykon historii Polski, 1995, s. 772

UDC 504.3:622.33

D. Demyanuk, étudiant de troisième année
I. Davydova, maître de conférences du département d'écologie, candidat ès sciences agricoles, conseiller en recherche
T. Staiulik, professuer de français de catégorie supérieure, conseiller en langue
Université Technologique d'Etat de Jytomyr

L'INFLUENCE DE L'INDUSTRIE DU CHARBON SUR L'ENVIRONNEMENT

Aujourd'hui, l'Ukraine est l'un des pays éco "sale". Car elle est saturée par les industries chimiques, métallurgiques, minières avec des technologies obsolètes. L'efficacité de la protection écologique de la nature dans une large mesure dépend de la perspective écologique des professionnels dont l'activité professionnelle est liée à l'environnement et ainsi que du niveau d'éducation du grand public. Comme toujours, la question concernant la réduction des émissions dans l'environnement et l'amélioration de son état est très importante.

Cela peut être atteint si chaque entreprise est intéressée non seulement par la qualité de ses produits, mais aussi par les conséquences des émissions liées à la production. Grâce aux différents types de systèmes d'épuration on peut réduire l'effet nuisible des émissions.

L'industrie du charbon est une des principales industries de l'Ukraine. Dans le cadre de son activité, à côté de sa contribution positive au bien-être de la population et de la société en général, il y a des facteurs défavorables, dont le principal est l'impact sur les composantes de l'environnement naturel. Le principal résultat négatif du travail des entreprises de l'industrie du charbon est la pollution de l'air par la

poussière minière qui n'est pas toujours inerte. Les principales substances polluantes de la production de charbon sont: le dioxyde de silicium, le méthane, le sulfure d'hydrogène, le monoxyde de carbone, dioxyde de soufre, l'oxyde d'azote.

Le charbon c'est une ressource énergétique principale de l'économie ukrainienne, et en même temps c'est une des plus nuisibles des combustibles fossiles. En Ukraine il y a deux ces types ce sont le charbon et la lignite. Les travaux miniers consistent en extraction des ressources minières et de la roche, leur chargement, transport et déchargement. L'extraction à ciel ouvert est utilisée quand d'une manière ouverte quand les ressources minières et la roche ne se trouvent pas en profondeur sous la surface de la Terre. La lignite est extraite de cette façon. Des minéraux qui se trouvent en profondeur sous la surface de la Terre sont extraits d'une manière souterraine. De cette façon on obtient le charbon, les minerais de métaux différents, le sel. Une entreprise minière ou on obtient des minéraux d'une manière souterraine s'appelle une mine.

Les mines de charbon rejettent en continu par les puits de ventilation des quantités importantes d'air pollué contenant une assez grande quantité de la poussière de charbon et de roche. La poussière de charbon contient dioxyde de silicium (SiO2) frais qui est dangereux pour la santé humaine, et qui est la cause de la silicose chez les mineurs ainsi que d'autres substances nocives, qui sont dispersés à la surface de l'atmosphère.

Donc, il faut noter que l'air ambiant d'une certaine façon peut toujours avoir la composition en pourcentage inconstant, à cause de l'impact de facteurs de l'environnement, en particulier de différents types de polluants, et dans ce cas particulier, les émissions des mines de charbon. Il faut comprendre que l'industrie du charbon de l'Ukraine ne joue pas le rôle qu'elle avait auparavant. La production de charbon a considérablement diminué et sa qualité se dégrade en raison d'appauvrissement des couches.

UDC 574:630.16

K. Denysyukova, Master student
I. Davydova, Associate Professor of Ecology
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

FEATURES of 137Cs ACCUMULATION BY MAIN SPECIES (plants) OF OVERGROUND COVERAGE IN PINE PLANTATIONS OF FRESH SUBORS IN ZHYTOMYR POLISSYA

As a result of the Chernobyl nuclear disaster, radioactive contamination of large areas of forests in Ukraine took place. Forests fulfilled their natural functions and protected settlements and farmland from radioactive contamination. The largest number of contaminated forest acreage is concentrated in Zhytomyr region. Exactly

in these forests before the Chernobyl catastrophe the picking-up of berries was carried out. Such kinds of berries as whortleberry, moorberry, raspberry, cowberry grow in the forests of Ukrainian Polissya. About 90 % of wild berries picking-up was conducted on the contaminated territories. The most widespread in a region is a whortleberry (Vaccinium myrtillus L.): in Zhytomyr region an area of its growth is 87,2 % of the area of all berry patches. A whortleberry is a strong store of ^{137}Cs, that is why its picking-up must be conducted taking into account the level of radio-active contamination of the territory. It is possible to pick up fresh berries of whortleberry at the soil contamination of 1,6 Ci/км^2.

After the Chernobyl Nuclear Power Plant disaster, wide radioecological researches were started (Krasnov, 1998; Scheglov, 1999; Bulavik, 1999) which engulfed all of the components of forest ecosystems. However, only a few researches were directly devoted to plants (Krasnov and others, 1995; Orlov and others, 1995; Eliashevich, 1998).

Field researches and collection of experimental materials will be conducted on the territory of Bazarsky forestry of DP «Narodickiy lisgosp APK», which has considerable contamination of soil of ^{137}Cs (6-393 kBk/m^2). 10 trial areas are going to be laid on the areas with the most characteristic forest plant terms in the region.

Taking into account the state of the problem, the following steps are included in the program of works:

- study of regularity of forests spatial radiocontamination in the region of researches;
- determining of the feature of distributing of ^{137}Cs in forest soils;
- study of intensity of radiocontamination of whortleberry;
- determining of the dependence between the content of ^{137}Cs in soil and in fitomass of whortleberry (Vaccinium myrtillus L.);
- generalization of the obtained data.

Using the results of the conducted researches two indexes will be determined – specific activity of ^{137}Cs in fitomass of whortleberry (both vegetative and berries) and calculation values of the coefficient of transition (CT) of ^{137}Cs. It is conditioned by the fact that both parameters are closely related to availability of radionuclide for the root feed of whortleberry, and also that CT is a relative index, and for its calculation the parameters which have wide enough amplitude of values are used.

For example, it is known from the previous researches, that the coefficient of varying of specific activity of ^{137}Cs in the sprouts of whortleberry was 45,7%, in berries – 32,7%, and for the coefficient of transition of the sprouts – 40,1%. We will calculate the dependences of content of ^{137}Cs in whortleberry on the constituents of radiation situation on the trial areas. The analysis of accumulation of ^{137}Cs by the different organs of whortleberry will be conducted. The samples will be selected, which will be carried out in the different points of the trial area, homogeneous on the character of relief, vegetation and agrotechnical state. In the laboratory with the help of gamma-spectrometric setting specific activity will be determined and the

coefficient of transition of ^{137}Cs from soil into the plants of whortleberry will be calculated according to the formula 1:

$$KP = \frac{Am}{As} \quad (1)$$

where: Am is a specific activity of ^{137}Cs in one unit of mass of dry whortleberry (Bk/kg);

As is contamination of soil of ^{137}Cs (Bk/m^2).

The contamination of soil was calculated using the formula 2:

$$As = h*p*Am \quad (2)$$

where: h is the depth of sampling, m;

ρ is a middle closeness of layer of soil, kg/m3;

Am is a specific activity of ^{137}Cs in one unit of mass of dry soil (Bk/kg).

Then all selected samples will be dried out to the air dry state, will be ground down and analysed in the laboratory on a spectrometer. The results of the researches will be processed on the personal computer with the use of application packages of EXCEL and STATISTIKA. The obtained results will be possible to use in practice for prognostication of radiation contamination of the harvest of berries.

UDC 62-529

Ye. Dlugash, Junior specialist student
V. Istyunkin, teacher of machine-tools and automated lines, research advisor
N. Barbelko, PhD in Pedagogy, language advisor
Berdychiv College of Industry, Economics and Law

INDUSTRIAL ROBOTS IN MODERN MACHINE-BUILDING INDUSTRY

Machine-building industry is one of the most important and complex manufacturing industry. It involves the design, production, and operation of machinery. Engineering deals with the construction of industrial machinery for the metallurgy, oil, chemical and other industries, heating and cooling systems, transport systems, air, space and watercrafts, robotics, medical devices, weapons, and others.

The introduction of industrial robots in today's engineering production allows doing full complex automation of all processes, raising the efficiency of human resources application, providing step-by-step reduction of application and even exclusion of hand, heavy and unskilled labor.

Industrial robot is a computer-controlled machine, which has movement functions with a high degree of freedom similar to human arms and hands and is able to move autonomously on the basis of sense and perceptions.

Industrial robots are important components of automated flexible manufacturing systems (FMS). They can increase productivity. Typical applications of robots include welding, painting, assembly, selection and installation, pick and place, packaging, product inspection, and testing; all these are accomplished with high reliability, endurance, speed, and accuracy [4].

Industrial robots are classified according to the following criteria (Table 1):

Table 1

Classification of Industrial Robots

Criteria	*Types*
Functional and structural capabilities	automatic, biotechnical, interactive
Purpose	universal, target, special
Mechanical structure	Cartesian / gantry, cylindrical, spherical / polar, SCARA, articulated, parallel
Type of production	casting, welding, forging, painting, transport and assembly
Coordinate system of manipulator's arm	rectangular (flat and spatial), polar and cylindrical, spherical, angular (flat, cylindrical and spherical)
Nominal load	super lightweight, lightweight, middleweight, heavy weight, super heavyweight
Type of drive	with electromechanical actuators, pneumatic actuators, hydraulic actuators, combined drives
Type of program	hard programmed, flexible programmed, adaptive, intelligent
Nature of control	positional, contour and combined

1. According to functional and structural capabilities and purpose industrial robots are divided into automatic, biotechnical and interactive manipulators.

– automatic robots are the first major class of robots. They are characterized by the fact that the management of actions occurs without direct human intervention. The human operator only set-ups, start-ups and controls the system. Automatic robots can be software, adaptive and intelligent;

– biotechnical robots are the second major class of robots. Human operator is involved in control. Biotechnical robots are classified into three types according to the control methods: team, copying and semi-automatic control;

– interactive manipulators are the third large class of robots. The partial participation of the human operator in the administration is their main feature. A human operator's interaction with a computer is expressed in such forms as: automated, supervisor and dialog control.

2. According to the purpose all industrial robots are divided into the following groups:

– universal, designed to perform several operations on different technological equipment;

– target, designed to perform one or more operations on the main technological equipment of various models;

– special, designed to perform only one type operations [3, p. 6].

3. The major categories of industrial robots by mechanical structure are:

– Cartesian / gantry robot;

– cylindrical robot;

– spherical / polar robot;

– SCARA robot;

– articulated robot;

– parallel robot.

4. According to the type of production all industrial robots are divided into: casting, welding, forging, painting, transport and assembly and so on.

5. According to the coordinate system of manipulator's arm all industrial robots are divided into: rectangular (flat and spatial), polar and cylindrical, spherical, angular (flat, cylindrical and spherical) [5].

6. According to the nominal load all industrial robots are divided into:

– super lightweight (0.08; 0.16, 0.32; 0.40; 0.50; 0.63; 0.80; 1.0 kg);

– lightweight (1.25; 1.60; 2.0; 2.50; 3.2; 4.0; 5.0; 6.3; 8.0; 10.0 kg);

– middleweight (12.5; 16.0; 20.0; 25.0; 32.0; 40.0; 50.0; 63.0 80.0; 100.0; 125.0; 160.0 ; 200.0 kg);

– heavy weight (250; 320; 400; 500; 630; 800; 1000 kg);

– super heavyweight (1250 and more) [1].

7. The major categories of industrial robots by the type of drive are:

– robot with electromechanical actuators;

– robot with pneumatic actuators;

– robot with hydraulic actuators;

– robot with combined drives.

8. According to the type of program all industrial robots are divided into:

– hard programmed robots are industrial robots without device for quickly change program;

– flexible programmed robots are industrial robots with the device for quickly change program;

– adaptive robots are industrial robots which carry out their activities on the basis of information about the objects and phenomena of the environment; this information is obtained in the process;

– intelligent robots are industrial robots that are able to plan their behavior according to the task, quality criteria, their own state and the state of the environment [2].

9. The major categories of industrial robots by the nature of control are positional, contour and combined [3, p. 6].

The technical indicators of industrial robots include:

– nominal load;

– work space (the space in which the executive mechanism of robot is located);

– service area (part of the workspace, where the industrial robot performs its work);

– the number of degrees of mobility (depends on the design of the driving mechanism);

– velocity of the manipulator links;

– the working body positioning error and the working body trajectory error.

This classification is designed for constant use, easy search and selection of the most rational alternative robot based on the ranking of all factors mentioned in this article.

REFERENCES

1. ДСТУ 2879-94. Маніпулятори, автооператори, роботи промислові та системи виробничі гнучкі. Терміни та визначення: Манипуляторы, автооператоры, роботы промышленные и системы производственные гибкие. Термины и определения: чинний від 1996-01-01. – Офіц.вид. – К. : Держстандарт України, 1995. – 31с.

2. Козирєв Ю.Г. Промислові роботи : Довідник / Ю.Г. Козирєв. – 2-е вид., перероб. і доп. – М. : Машинобудування, 1988. – 392 с. : іл.

3. Проць Я. І. Захоплювальні пристрої промислових роботів : Навчальний посібник / Я.І. Проць. – Тернопіль : Тернопільський державний технічний університет ім. І. Пулюя, 2008. – 232 с.

4. Робототехніка : Підручник / [В.І. Костюк, Г.О. Спину, Л.С. Ямпольський, М.М. Ткач.]. – К. : Вища школа. – 1994. – 447 с.

5. Спину Г.А. Промислові роботи. Конструювання і застосування : Навч. посібник. – 2-е вид., перероб. і доп. – К. : Вища шк., 1991. – 311 с. : іл.

UDC 504:663,85

I. Dziublyk, Master student
I. Davydova, PhD of Agr. Sc., research advisor
Zhytomyr State Technological University

QUALITY ASSESSMENT OF CARBONATED SOFT DRINKS

As you know, water is the source of life on Earth. It is not surprising that it is the main component of the human body and reaches about 70% of body weight. To maintain the water balance we should consume more than 2.5 liters of fluid a day, among which today carbonated soft drinks have a great importance. This food product is very popular among consumers, because at a certain level of development of productive forces and of the population drinks are essential, it is important attribute of civilization. Society can not give up their production and use, and today they have become products of mass consumption which is the main cause of dynamic development and expansion of product range.

Last years in the food industry of Ukrainian production of soft drinks takes first place and it is about 40% of the total output of food. At the same time, although the usage of soda steadily increases, we note that last years the rate of growth for drinks significantly behind similar indicators in other categories of non- alcoholic drinks such as juices or mineral and drinking water. Despite the increase in sales of carbonated beverages, in the structure of sales of soft drinks in general, their share is gradually declining. Obviously, this trend is due to the increase in the number of consumers that are oriented to healthier drinks. It is difficult include soda in healthier drinks because it contains a lot of sugar, and various synthetic additives and flavors.

The range of soft drinks on world markets and in Ukraine is constantly expanding mainly through the use of new, innovative materials, and various food additives that provide desired taste, color, appearance. But with the emergence of new functional drinks there are new counterfeit products that are dangerous and are a serious threat to the health of the Ukrainian population. Therefore, to prevent the harmful effects of non-alcoholic carbonated drinks and its components on the human body, we must make efforts at all levels to determine the quality of the product and prevent counterfeit products in trade.

Thus, this issue is particularly relevant as a comprehensive study of carbonated soft drinks.

It is found that examination of the quality of carbonated beverages typically conducted in three main areas:

1. organoleptic evaluation of carbonated beverages;
2. evaluation of physical and chemical indicators of quality;
3. examination of labeling and packaging.

The organoleptic examination quality of soft drinks realize on the following indexes: colour, outward look is from 1 till 7 marks, taste and smell is from 6 till 12

marks according DSTU 7099:2009 «Product of non-alcoholic industry. Definition methods of organoleptic indexes and production volume».

Physico-chemical methods of control the quality soft drinks are based on the following indexes:

- the fullness of pour;
- the content of dry substances;
- acidity;
- stability;
- the carbon dioxide content (CO_2).

During the examination of the marks and the packagings estimates the correctness of label, the fullness of information, the availability of distortions, deformation and breaches etc.

We decided to evaluate the quality of soft carbonated drinks. That's why during the further work the main aim is installation of compliance of these products of domestic production, the requirements of standard documents for organoleptic and physico-chemical indicators and marking. For realizing this aim we should solve such tasks as:

- to choose the examples of soft drinks;
- to check the conformity of marking of researching examples according to the requirements of the Technical regulations;
- to explore the examples of soft drinks according to the organoleptic and physico-chemical indicators;
- to install the conformity of researching examples according to the legislation of Ukraine.

Promulgation of these results permit to population to choose the products of the best quality that will satisfy their needs, and will not threaten to health.

UDC 504.4 (477.42)

I. Dziyublyk, Master student
N. Kurnosova, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

BIODIVERSITY: ITS STATUS TRENDS AND ENVIRONMENTAL LEGISLATION IN UKRAINE

Biological and landscape diversity is one of our greatest riches. Biodiversity enables the existence and development of many ecosystem services: harvesting and selling of forest resources, hunting, fishing, herding cattle, tourist and recreational services, etc. Nowadays natural diversity is in a rapid and continuing decline. Across the country, valuable and characteristic habitats are suffering serious damage; this has

led to decline in the diversity, number and range of a wide variety of species, habitats and landscapes.

This decline is caused by both anthropogenic and natural factors. Each year a large portion of wood is being cut through the sanitary measures, which harm biodiversity. The current sanitary rules in Ukrainian forests govern sanitary actions in any woods. For nature and reserve fund this means that all major protected sites (age-old forests, hollowed trees and dead wood) can be cut down in all protected forests and all other forests in the country. It is worth noting that after 2010 the forest sanitation on the territories of natural reserves is carried out with involvement of the Ministry of Ecology and Natural Resources that significantly reduced the amount of timber harvesting and reinforced control over loggings. Uncontrolled use of forest resources (deforestation), which violates the natural conditions of existence of rare species of plants and animals, is one of the main threats to biodiversity of forest ecological systems. Forest plantations are subject to negative impact caused by industrial pollutions and climate change. Excessive exploitation of the steppes (plowing up, overgrazing, burning dry remnants of natural vegetation) leads to the destruction of natural steppe ecosystems, impairs the conditions of ensuring territorial cohesion of the areas with natural landscapes. The loss of the steppe ecosystems is also observed due to their scientifically unjustified afforestation.

Among the natural factors, one can distinguish an excessive overgrowing of small rivers with air-water vegetation that reduces the biodiversity of aquatic organisms (plants and animals). The main threat to biodiversity in the woods is the effects of climate change. For example, increasing temperature by one degree causes a shift of the boundaries of natural areas by 160 km. Ukraine could not escape such changes. Given that an average temperature in Ukraine for the last ten years has risen by 0.3-0.6 °C (for the last 100 years - by 0.8 °C), the shift of the boundaries of natural areas has already become a reality, which is proved by appearance of species of flora and fauna not specific to the zones. An urgent problem for the Ukrainian Carpathians is drying spruce forest, which is considered by scientists as a disaster and priority problem to solve. Predicting the effects of climate change in Ukraine shows that doubling carbon dioxide content in the atmosphere can trigger increase in the amount of precipitation by 20%; relocation of subtropical cyclones in the moderate and northern zones, which will facilitate desertisation of the South of Ukraine; decrease of forests productivity on the whole territory of Ukraine, in particular as a result of spread of diseases and pests.

The National Programme for the Development of the National Ecological Network of Ukraine for 2000 - 2015, approved by the Law of Ukraine № 1989-II of 21.09.2000 is the policy paper in the area of protection, restoration and sustainable use of biodiversity. The Programme was developed in the context of requirements to further elaboration, improvement and development of the ecological legislation of Ukraine and also in accordance with the recommendations of the Pan-European Biological and Landscape Diversity Strategy (1995) regarding the issue of

development of the European Ecological Network as a unified spatial system of the territories of European countries with natural or partly changed conditions of landscape. The main purpose of the Programme is to increase the land area of the country with natural landscapes to the level sufficient to maintain their diversity, close to their inherent natural state, and shaping their territorially unified system established to provide opportunities for natural ways of migration and dispersal of the plant and animal species, which would provide for preserving natural ecosystems, species of flora and fauna and their populations. The national ecological network has to meet the requirements to its functioning within the Pan-European Ecological Network and fulfil the leading functions of conservation of biological diversity. In addition, the Programme has to facilitate well-balanced and sustainable use of biological resources in the economic activities.

On December 21, 2010 the Verkhovna Rada (Parliament) of Ukraine approved the Law of Ukraine "On Main Principles (Strategy) of the National Ecological Policy till 2020". The Strategy defines the main tasks and goals. Biodiversity is highlighted in Goal 5. Preventing loss of biological and landscape diversity and developing ecological network. To achieve this goal the following task were defined:

- establishing a system of preventive measures for the invasive alien species by 2015 and ensuring control over introduction of such species to ecosystems, including the marine ones;
- improving the regulatory framework for the system of control of trade in endangered wild flora and fauna species, by 2015;
- holding the awareness campaign about the value of ecosystem services as in the case of the Ukrainian ecosystems by 2015,developing the ecosystem services assessment by 2015 and its subsequent application;
- enlarging the national ecological network area to the level (41% of the country), necessary to ensure the environmental safety of the country by 2015; implementing the system of environmental measures on conservation of biological and landscape diversity and expanding the area of nature and reserve fund up to 10% in 2015 and up to 15% of the total territory of the country in 2020;
- introducing the ecosystem approach into the management activities and harmonizing the environmental legislation in accordance with the directives of the European Union by 2020;
- creating the network of centres of artificial breeding and reacclimatization of rare species of plants and animals and those that are endangered by 2020;
- creating the system of economic levers to facilitate conservation of biological and landscape diversity and development of ecological network on the lands of all ownerships by 2020;
- taking administrative measures to stop a disastrous decrease in aquatic livestock because of over-exploitation and degradation of the natural environment by 2015.

The main mechanism for implementing the Strategy is the National Environment Protection Action Plan, which was adopted on 25 May 2011 by Order № 577-r of the Cabinet of Ministers of Ukraine and focused on the period of 2011-2015.

Under Goal 5, it is envisaged to implement 43 measures, which correspond to the Aichi Biodiversity Targets, including the mostly unchanged activity to determine the areas where it is planned to create the representative and interrelated nature protection territories covering not less than 17% of the land and inland waters and 10% of coastal and marine areas by 2020.

A great attention is paid to the task of evaluating and classifying the ecosystem services, monitoring biodiversity and ecological network, keeping the state cadastres of flora and fauna, the Red and the Green Books of Ukraine, the conservation and restoration of populations of the species of animals, which are listed in the Red Book of Ukraine and protected in accordance with international agreements, measures of environmental education in schools.

UDC 621.914

M. Gerasimchuk, Master student
V. Vysotskyi, Master student,
N. Balytska, PhD in Engr., lecturer, research adviser
I. Melnychenko, lecturer, language advisor
Zhytomyr State Technological University

DETERMINATION OF THE CRITICAL TEMPERATURE DIFFERENCE THAT CAUSES LOSS OF BALANCE FLAT SHAPE OF THE DISK CUTTERS

One of the factors of working condition of disc cutters is a stable form of balance of the disc (resistance).

The main factors of the sharp loss of mill stability are cutting force and uneven heating of the radius of the disc. The identification of the critical value of these factors is necessary for assessing the stability of the mills. The issues of the loss of dynamic stability of the action of cutting forces were considered in [1]. This work is aimed at determining the critical temperature difference at which the disk cutter is losing stability.

The peripheral zone of cutter disc heats up more than the inner ring zone during processing. As a result, thermal stress appears. Its value depends on the temperature difference ΔT and the law of temperature distribution on the disc cutters.

The research [2] shows the dependence for calculating the critical temperature difference at which the drive loses stability:

$$\Delta T^{кр} = \frac{1}{\alpha_1} \frac{\left(\frac{h}{R}\right)^2}{12\ 1\text{-}\mu^2} f_0'\ c,\lambda\ + \frac{\rho v^2}{E} f_o''\ c,\lambda\ \ , (1)$$

where $E=2\cdot10^{11}$ is Young's modulus, Pa;
h is the thickness of the disc, m;
μ=0,3 is Poisson's ratio;
R is the outer radius of the disk, m;

$f_0(c,\lambda) = 98{,}185$, $f_o(c,\lambda) = 2{,}61$ is dimensionless function [2];

ρ=7850 kg/m^3 is material density disk;
ν=0,667 m/sec is the rotational speed of the disc.

The first item in equation (1) describes the critical temperature difference of the rotating disk, and the second $\Delta T^{кр}$ takes into account the increase of centrifugal forces of inertia.

Groove cutting and processing operations are performed at low cutting speeds (40 m / min), so the effect of inertia forces on the size of the critical temperature difference is minimal, and thus the second item in the calculation can be neglected.

The maximum allowable temperature difference along the radius of the disk cutter is given by:

$$\Delta T_{доп}^{max} = 0{,}85 \cdot \Delta T^{кр}. (2)$$

Table. 1 shows the calculated value of the critical and the maximum temperature difference for different sizes and cutting trench cutters.

Table 1

Estimated value of the critical temperature difference for different sizes and trench cutting mills

№	Dimensions cutters, mm			Cutting speed, m,min	кр , ° C	,°C
	D	d	h			
1	63	32	0,3	40	110,7	94,095
2			0,5		307,04	260,98
3			1,0		1227,56	1043,43
4			2,0		4910	4173,5
5	80	34	0,5		127,7	108,55
6			1,0		510,56	433,98
7			2,0		2042,25	1735,91

8	100	34	0,5		60,93	51,79
9			1,0		243,61	207,07
10			2,0		974,44	828,27
11	125	34	0,8		81,04	68,88
12			1,0		126,62	107,63
13			2,0		506,5	430,53

Analyzing the data, we can conclude that the cutters of 1 mm thick in the test range of diameters are sensitive to temperature changes within the range and may lose stability consequently. These results require further research in the area, i.e. improving the design of mills, definition of the cutting mode etc.

REFERENCES

1. Balytska N.O. Improving the performance of trench cutters: Dis. … Ph.D.: 05.03.01. – K., 2015. – 164 p.

2. Stahiev Y.M. Stability and oscillations of flat circular saws. M.: Timber industry, 1977. - 267 p.

UDC: 574:631.4

O. Gorecka, Student
M. Vinitschuk, Professor, Dr. Biol. Wissenschaften, research advisor
S. Kuriata, Senior lecturer, language advisor
Technologische Universität Zhytomyr

ABSCHÄTZUNG DER DOSISBELASTUNG DER BEVÖLKERUNG ABHÄNGIG VON DER ART DES BODENS

In Folge des Unfalls auf dem Kernkraftwerk in Tschernobyl wurden Gebiete mit verschiedenen Arten von Böden verschmutzt. Es bleibt unbekannt, wie eine Bodenart und ihre mechanische Zusammensetzung die Dosis externen und inneren Bestrahlungen der Bevölkerung beeinflusst. Angesichts der oben genannten war das Ziel unserer Arbeit, die Besonderheiten der Bildung der Strahlungsdosis der Bevölkerung je nach der Bodenart zu untersuchen.

Auf dem Grund unserer Aufgabe wird die Arbeitshypothese aufgebaut, dass Radionukliden auf den verschiedenen Böden aus einem Boden in die Pflanzen unterschiedlich eingesaugt werden. Es ist offenbar, dass Radionukliden auf den Böden mit der einfachen mechanischen Zusammensetzung schneller als auf dem Lehmboden und dem Schwerlehmboden eingesaugt werden. Also für den Vergleich des Einsaugens von Radionukliden in verschiedenen Böden beschreiben wir diesen Prozess am Beispiel von zwei Bezirken: die erste Narodytschi (Zhitomirer Gebiet), wo SOD-Podsol Böden dominiert und die zweite Boguslav (Kiewer Gebiet), wo die Schwarzerde dominiert.

Die Ergebnisse der gesamten Dosimeters Zertifizierung von Orten ermöglichen die Größenordnung der berechneten effektiven menschlichen Strahlungsdosis in den Orten zu schätzen. Die Untersuchung umfasste die Orte, in denen innerhalb von fünf Jahren nicht weniger als 10 Bewertungen der Gehalte von Radionukliden in Milch und Kartoffeln aus lokaler Produktion und 30 Messungen der Aktivität von Radionukliden im Körper, die in diesem Ort wohnen, mit der Hilfe des Zählers für die Strahlung des Menschen erhielt.

Da unser Ziel ist herauszufinden, wie die Belastungsdosis der Bevölkerung je nach Bodenart nach einem zufälligen Verfahren im Naroditschier Bezirk 14 Orte und im Boguslaver Bezirk 18 Orte mit unterschiedlichen Gehalt von ^{137}Cs im Boden gewählt wurden. Der maximale Wert des Gehalts von ^{137}Cs im Boden waren 13 Ci/km^2 im Naroditschier Bezirk (im Dorf Loznitza) und 4 Ci/km^2 im Boguslaver Bezirk (Stscherbaschyntci). Dabei betragen die Mindestwerte des Gehalts von ^{137}Cs im Boden im Naroditschier Bezirk 1,8 Ci/km^2 (Neuen Radtscha und Grezlja) und im Boguslaver Bezirk ist 0,96 Ci/km^2 (Bijivtzi).

Um die Faktoren der Bewertung der Strahlungsdosis der Bevölkerung in verschiedenen Böden zu vergleichen, wird die Korrelationsanalyse von uns gemacht. Auf dem Grund der erhaltenen Daten kann man argumentiert werden, dass der wichtigste Faktor, der die Entstehung der Dosis der inneren Bestrahlung der Bevölkerung im Naroditschier Bezirk beeinflusst, ist spezielle Aktivität von ^{137}Cs in Milch. Es gibt eine sehr hohe Abhängigkeit von Parametern und Korrelationskoeffizienten, die an 1 herankommen. Im Vergleich zu Boguslaver Bezirk, ist es offenbar, dass die maximale Dosisbildung von externen Bestrahlungen der Bevölkerung das Gehalt von ^{137}Cs im Boden beeinflusst. Da der Korrelationskoeffizient kurz vom 1 ist, ist die Datenabhängigkeit zwischen Parametern sehr hoch.

Somit die Hypothese, dass Radionukliden auf den Böden mit der einfachen mechanischen Zusammensetzung schneller als auf dem Lehmboden und dem Schwerlehmboden eingesaugt werden, wird bestätigt. Auf SOD-Podsol Böden bei der Gestaltung der internen Strahlendosis spielt eine wichtige Rolle eine bestimmte Aktivität ^{137}Cs in Milch. Auf den grauen, dunkelgrauen Böden und die Schwarzerde Podsol mit der größeren mechanischen Zusammensetzung ist wichtig das Gehalt von ^{137}Cs im Boden bei der Gestaltung der externen Strahlendosis der Bevölkerung.

UDC 613.155:537.568.011.57

O. Grek, graduate student,
T. Mitrofanova, graduate student
V. Manoylov, Dr in Eng., Prof., research advisor
O. Kashapova, Lecturer, teaching center Elit Gold, language advisor
Zhytomyr State Technological University

THE SYSTEM OF AIR IONIZATION PRODUCTIVITY

Introduction. Health and normal functioning of the organism largely depends on the condition of ambient air surrounding people. That is what exactly one of the most important of human habitats. Advanced technologies, urbanization of cities, cars, factories and so on have not only improved our lives in the sense of development and opportunities, but also had a negative impact on the environment (ecological situation) in big cities, and at the same time on the health and well-being of people. Ecologists, who observe the condition of the air, are sounding the alarm. [1 p.149]. They affirm that different chemical impurities are found in the air, which negatively influence the health of people and the state of their body. Literary sources analysis has shown that the "right", namely close to natural, balance of positive and negative air ions have a beneficial effect on the health and general human well-being. That is why the problem of managing air quality parameters is one of the most important for many fields of medicine and hygiene.

Problem statement and relevance. Today quite developed range of materials are accumulated for studying, development and introduction into medical and environmental practices: research methods of influence negatively charged air particles on the human body on the whole and its separate systems; ionization as air decontamination method of the working area; development and research of methods of air ionization in enclosed spaces (Chizhevskiy A.L., Lepikhov P.V., Nedobora O.A., Gliva V.A., Zaporozhets O.I., Korenovskaya O.L. et al.)

A comparative table of existing ionizers and counter air ions was in the work [1]. The disadvantage of all existing ionizers is impossibility of indicating the number of generated ions and opportunity to regulate and establish the necessary air ions dose. It limits the use of air ionizers in medicine and explains the fact that air ionizers are used either at home for improvement of air or in special research laboratories [1 p.149].

Main part. Counters, which are produced nowadays based on the aspiration method of measurement, which has some significant drawbacks:

1. time-consuming to measure the concentration of ions;
2. air blowing through the aspiration chamber greatly distorts the picture of the field, that is why it becomes impossible to measure the concentration in a certain space point;
3. low accuracy.

The device for evaluation of air ionizers productivity consists of exploring ionizers, capacitor and air ions counter. Linear sensor is placed in the chamber, which

is made of antistatic material. The source of air ionization is in the upper plane of antistatic camera. Holes are placed on the sides of the camera vertically to ionizer that allows you to move the linear sensor, distancing it from the power with a step of 5 cm. Also, a capacitor plays an important role in this system which has two outputs. A metal plate is attached to the first output of a capacitor, which is located at the bottom of the camera, and to the second output of the capacitor the linear conductor is attached, the size of which is determined by the number of air ions. System shown in Figure 1.

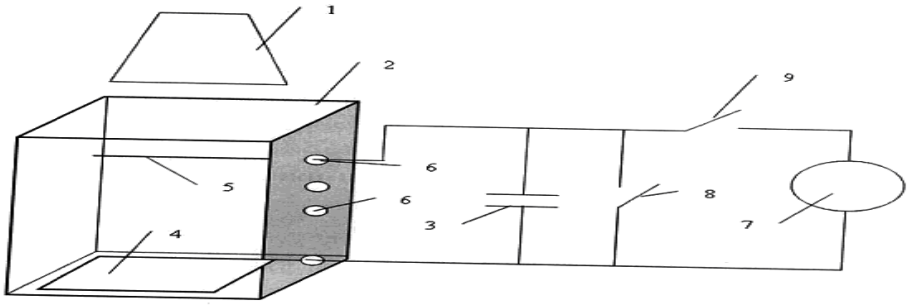


Figure 1 – «The system of air ionization productivity»

1– ionization; 2 – antistatic chamber; 3 – capacitor; 4 – metal plate; 5 – linear conductor; 6 – holes; 7 – microcoulonometer; 8,9 – button.

The advantages of the offered system are [2]:

- antistatic chamber - due to antistatic chamber, the impact of the movement of environmental air masses on the ions flow reduces, that increases the reliability of evaluation;
- using buttons of the capacitor charge and discharge reset allows simplify the operation of determining the number of charges or air ions;
- the use of a linear conductor reduces dependence of the sensor impact on the estimating flow, as a linear conductor creates less resistance to estimating flow of air ions, namely selects only a small portion of the ions flow, and sensor sensitivity is determined only by the active length of the linear conductor and by range of the microcoulonometer.

REFERENCES

1. Митрофанова Т.В. Класифікація аероіонізаторів за принципом отримання аероіонів та їх вплив на здоров’я людини / Т.В. Митрофанова, Т.М. Нікітчук // Вісник Житомирського державного технологічного університету. Серія: Технічні науки. – 2015. – № 2 – С. 149 – 153.

2. Патент на винахід № 103661. Пристрій для оцінки продуктивності іонізаторів повітря / Березовський Вадим Якимович, Мартинчук Петро Петрович, Левашов Михайло Іванович, Коренівська Оксана Леонідівна,

Митрофанова Тетяна Владиславівна. – Заявл. 19.06.2015; опубл. 25.12.2015, Бюл.№ 24.

UDC 631.81.095.337

V. Husarchuk, Master student
M. Vinichuk, Dr. Biol., Prof., research advisor
S. Sukhovetska, language advisor
Zhytomyr State Technological University

INFLUENCE OF FOLIAR FEEDING OF SPRING WHEAT BY ZINC SOLUTION ON THE TRANSITION OF RADIO CESIUM FROM SOIL TO PLANTS

The importance of the production of agricultural products with a minimum content of radioactive substances is the main feature of farming on radiation contaminated territories. It can be achieved by creating conditions to minimize the radionuclide transfer from soil to plants. To reduce contamination of cropproducts it is important to apply those agrotechnical and agrochemical measures of agricultural practice that do not require significant changes in the existing technologies of growing crops.

Microelements play certain role in reducing radionuclides transfer to plants. It was established that the effect of microelementsis especially important in those soils where the content of microelements is low. Soils of Ukrainian Polissia, which have suffered from contamination by radioactive substances as a result of the Chernobyl accident, have mentioned above characteristics.

The role of microelements is not limited only by their interaction with radionuclides or macroelements. They can alsoinfluenceon the permeability of cell membranes for radionuclides with certain ionic radius, charge, as well as the geometry of coordination and electronic configuration [1].

Research on the effect of foliar feeding by solution of zinc on ^{137}Cs accumulation in spring wheat "Struna Myronivska" was conducted during 2014-2015 on the fields of the village Bazar, Zhytomyr region and in radioecology laboratory of Zhytomyr State Technological University. The soils of research areas are sod-podzol (gleyey, sandy-loam on moraine and water-glacial sediments with moraine underlay).

To determine the effect of foliar feeding by solution of zinc in different phases of growth and development on ^{137}Cs accumulation by spring wheat, sulfate salts of zinc (ZnSO4) at a concentration of 0.05% off mass ratio were used. Repeated experiments are quadruple. Consumption ofzinc solution foranindividual researchplot of 3.5 x 2 m^2 amounted to 0.28 liters, and for the total plot of 14 x 10 m^2 amounted to 5.6 liters. The scheme of the experiment included control and four experimental choices: 1 - control (without spraying); 2 - spraying crops in the tillering phase; 3 - spraying in the phase of stem extension; 4 - spraying in the phase of flowering; 5 - spraying in the phase of fruit development.

Sampling of soil and plants is carried out in the phase of fruit development.

Samples of soil. Two soil samples from each individual plotwere chosen and formed a combined sample. Soil sampling was performed using a soil drill with a diameter of 5.7 cm and a height of 15 cm. Soil samples were dried to constant weight, sieved by a sieve of 2 mm diameter to removeplant roots from samples and to makethemixture homogeneous. After that, the mixture was placed in geometry of 60 ml and weighed. ^{137}Cs specific activity was measured in these soil samples using the system of scintillation spectrometry GDM 20. Measurement error did not exceed 5%. On average, the procedure of samples measurement lasted for 20 minutes.

Samples of grain wheat. Samples of grain were selected by cutting them at the height of 5 – 7 cm at two points on each of the individual plots using a frameof 0.5 x 0.5 m^2. Selected samples were combined to forma combined sample. Plants were threshed by hand and grain, purified from straw remains, was weighed and placed in 35 ml volume geometry. Also, thecalculation of yield per 1 hectare of crop was done. On average, the procedure of wheat samples measurement lasted for 6 - 7 hours due to their low specific activity.

Samples of straw. After threshing of wheat, straw samples were weighed and crushed to achieve a homogenized state.The resulting material was placed in 60 ml volume geometry andweighed again. On average, the procedure of straw samples measurement lasted for 6 - 7 hours due to their low specific activity.

^{137}Cs specific activity of grain and straw samples of spring wheat was also measured by detector GDM 20. To evaluateradionuclide transfer from soil to grain and straw, the ratio (transfer factors, TF): ^{137}Cs in grain or straw, Bq/kg / ^{137}Cs in soil, Bq/m^2, m^2/(kg^{-1}) was used.

Specific activity in grain and straw samples changed over the years in different phases of spring wheat growth and development. On average, the specific activity in the grain of control variant ranged from 16 to 27.3 Bq/kg during 2 years. When spraying plants in the phase of tillering, the radionuclide specific activity in grain was about 2 times lower compared to the control indicator. Similarly, when spraying in the phase ofstem extension, the specific activity of grain was by 58% lower compared to the control indicator. Specific activity of grain with foliar feeding byzinc solution in the phase of flowering did not differ from control indicator. Spraying plants in the final phase of grain fruit development did not affectthe level of specific activity of grain compared to the control variant.

Cesium specific activity in straw ranged, on average, from minimally detected level to ≈ 100 Bq/kg in the control variant during 2 years. The levels of theradionuclide specific activity in straw appeared to be the lowest at spraying plants in the phase of fruit development in comparison with the control variant.

^{137}Cs transfer factor from soil intograin and straw of spring wheat at its foliar feeding by solution of zinc for 2 years of research are presented in Figure 1.

Thus, as seen in figure, ^{137}Cs transfer factors for grain and straw, when spraying plants of spring wheat with a solution of zinc in 2015, were significantly lower compared to 2014 year due to arid conditions prevailing during the growing season in 2015. On average, for 2 years of investigation, the coefficients of transfer

factor from soil to grain on the control variant fluctuated in the range from 0.00013 to 0.00016, while to straw - from 0.00011 to 0.00053. When spraying plants in the phase of tillering, TF from soil to grain, on average for 2 years, was by ≈ 50% lower compared to control indicator (Fig. 1). A similar efficiency of foliar feeding of wheat plants with a solution of zinc occurred at spraying in the phase of stem extension.TF of the radionuclide from soil to grain, for 2 years of investigation, turned out to be approximately 2 times lower in comparison with the control indicator. Spraying wheat plants in the phase of flowering proved ineffective – transfer factor of radionuclide from soil to grain practically did not change compared to the control variant. When spraying plants in the phase of fruit development, TF values of radio cesium from soil to grain, for 2 years of investigation, were the same with control variant values (Fig. 1).

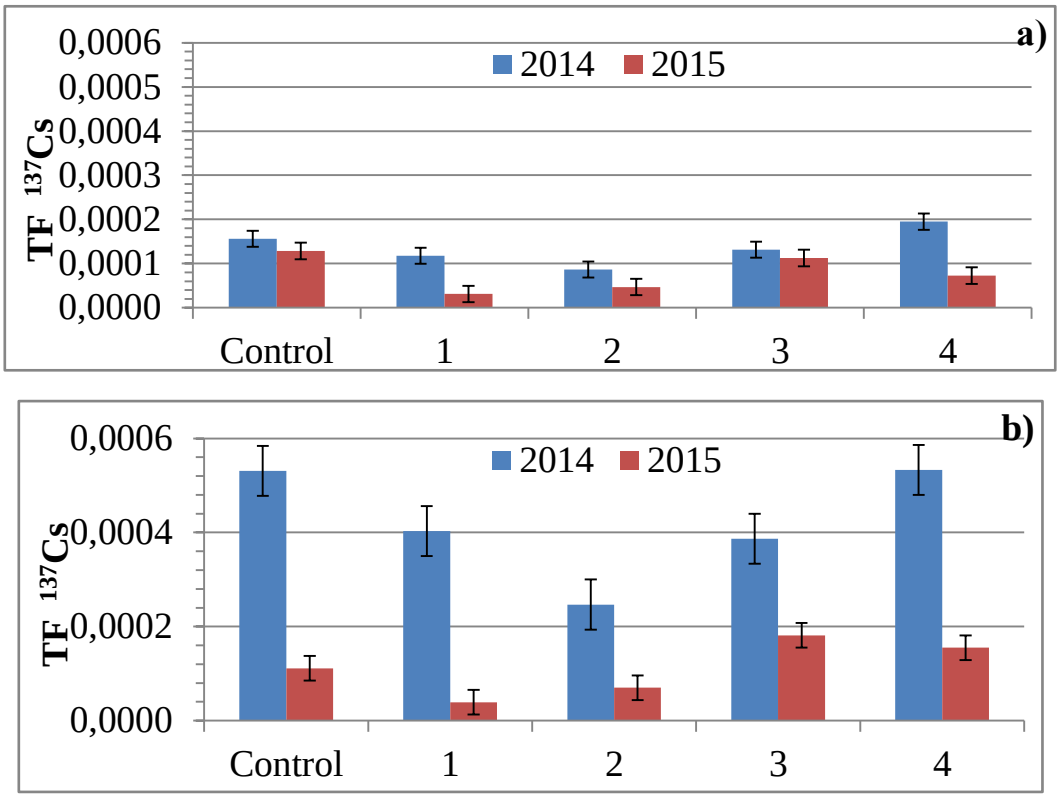


Fig. 1 ^{137}Cs transfer factors in grain (a) and straw (b) samples of spring wheat (2014 – 2015). The phases of plant growth and development at the time of spraying 1 - tillering phase; 2 - phase of stem extension; 3 – phase of flowering; 4 - phase of fruit development. n = 4.

A similar effect of foliar feeding of wheat plants with a solution of zinc on the value of transfer factor from soil to plant was observed in straw. Thus, the most effective was spraying wheat in tillering phase and stem extension. When spraying wheat in the tillering phase, the straw received the radionuclide by almost half (≈ 45%) less than in control variant, while spraying in the phase of stem extension by 50% compared with the control value. Feeding wheat plants with a solution of zinc in the second half of the growing season proved ineffective; transfer factors of

radioactive cesium from soil in straw, on average for 2 years of investigation, were at values of control variant.

Thus, according to the received results, the first half of the growing season, namely the phase of tillering and stem extension, is the best time for foliar feeding of spring wheat by solution of zinc to reduce radio cesium transfer from soil to grain and straw when growing on sod-podzol soils. This technique provides a two-fold reduction of radionuclide transfer from soil both in grain and straw.

REFERENCES

1. Гудков І.М., Вінічук М.М. Сільськогосподарська радіобіологія: Навч. посіб. для аграр. вищ. навчальних закл. – Житомир: ДАУ, 2003. – 314 – 315 с.

UDC 656.07

A. Ishchenko, Master student
K. Kuzmin, Master student
O. Kravchenko, Dr.of Engr., Prof., research adviser
I. Melnychenko, lecturer, language advisor
Zhytomyr State Technological University

RESEARCH OF OPPORTUNITIES FOR DEVELOPMENT OF AUTOSERVICE ENTREPRENEURSHIPS ON HIGHWAYS

Several international corridors pass through the Zhytomyr region, one of which is highway M-06 of European route E40. After the reconstruction of the road its quality increased significantly and that helped to increase the average speed and to improve the comfort and economy of movement on the road. On the road its own infrastructure has appeared: gas stations, cafes, camping etc. And this means new vacancies and taxes to the state budget.

According to the recommendations of the European Agreement on International Transport and the Agreement on Trans-European highway, medium distances between roadside service facilities should be: canteens - 30 km; filling stations - 20 km; service stations - 50 km; parking lots - 100 km; hotels - 50 km; shops and toilets –every 15 km.

If Ukraine has extensive transport infrastructure and, being at the crossroads of the most important areas of world trade between Europe, Asia and other continents, it will have all the prerequisites for sustainable development of this sector in terms of balanced public policy.

In order to develop recommendations for the design (or reconstruction) of auto service entrepreneurships along the highways the factors affecting land area service centers were investigated. It was explored that for the optimal area for roadside

facilities of freight servicecentres, we can take 1500 - 2500 m2, which is enough for 4-5 posts with additional facilities.

The calculation of the number of working positions for each individual case can be determined by the formula

$$n^r = k^{nr} \sum_{i=1}^{2} \left[\left(I_i^N \cdot I_i^{S_r} \cdot k_i^{ob} \cdot N_i{}^r \right) \Big/ k_i^u \cdot \pi \right], \quad (1)$$

where n^r is a number of working positions that are necessary to care for service centreterritory;

k^{nr} is an adjustment factor of regional structure, accounting of allowable saturation of auto service facilities in the area is given by an expert $\left(\sum_{i=1}^{R} k^{nr} = 1 \right)$;

$I_i^{S_r}$ is the index of change in the regional structure of the existing fleet of cars *i* –of the type for *r* – territory;

k_i^{ob} is the ratio of average service of cars of *i*-type;

N_i^r is the number of cars of *i* - type at *r* - territory;

k_i^u is the capacity utilization ratio for the cars of *i* - type;

π is the prognosticated standard of service, the number of cars per one working post.

For the development of freight service centers the investments as governmental programs for developing infrastructure and private entrepreneurs, as well as the investments by foreign auto companies which have an interest from sales and service of brand vehicles are necessary.

The investments (*S*) necessary to increase the service capacity can be calculated approximately using the average coefficient of capital intensity for creating a working post ($K_{C.F.}$) and ratio, which determines the required number of service centers posts located in the roadside area ($M_{CSC.P.Z.}$) by the formula:

$$S = K_{C.F.} \cdot M_{CSC.P.Z.} \quad (2)$$

According to the Bellman's principle of optimality, the management of investments for each year of service entrepreneurships must be built in such a way that the amount of income will be the highest at all the stages till the end of the investment process, including maximum income in the considered stage. Then overall functional management of investments will take the form:

$$W = \sum_{i=1}^{n} w_i = \sum_{i=1}^{n} \max_{x<=S} \left[P_i(x_i) + w_{i+1}(S - x_i) \right], npu\, x_n(S) = S, \quad (3)$$

Where w_i is a value of gain (income) derived from the sale of investments on the i-th year of CSC work;

$P_i(x_i)$is income from funds that was invested in the i-th company on the i-th year of work.

To achieve the greatest benefit of the company and meet the majority of customer needs for company service center, the following operations must be performed: car wash, station maintenance and current repairs, tire assembly work.

When formingthe warehouse of spare parts, planned costs for parts necessary for technical maintenance and replacementsmust be considered. One of the important quality characteristics of the CSC is the coefficient of technical readiness of vehicles, which is determined by *i* type details as a ratio of proper functioning time $t_{iwork}$to the amount of correct operation time $t_{iwork}$and forced idle $t_{irepairs}$of vehicle taken for the same calendar period.

Given the random nature of the values of these variables, they are taken as the average (for all vehicles of this type) in the expression for the coefficient k_i. Moreover, coefficient of technical readiness of entire vehicle *k* is determined on as the "weakest link" principle, i.e. as

$$k = \min_{0 \le i \le n} k_i \qquad (4)$$

The calculation shows that the lack of details in a warehouse can make significant change in the coefficient of readiness and, thus, violate accepted in practice restrictions $k \ge 0{,}86$. That is why a problem of using criteria that reflect the storage of this typedetail at the warehousecomes up, especially as a real time of waiting spare parts may differ from the standard. As the example of changes in technical readiness of trucks Volvo FH 1242 the results (Table 1) about feasibility of storing spare parts at the warehouse was obtained.

Table 1.Calculation results ofstoring details feasibility determination of trucks Volvo FH 1242

Detail	Delivery time, hours	Cost, UAH.	Probability of refusal	Expediency
Airsprings	24	1364,7	0,0000759	Not to keep
Cable ABS	1	1000,00	0,0002526	Not to keep
Fanbelt	24	618,36	0,0000829	keep
Powerrelays	24	1600	0,0000940	keep

Wheelstud	24	170,74	0,0000951	keep
Generatorbelt	24	485,72	0,0000992	keep
Block EBS	336	7997,57	0,0001139	keep
Sensor ABS	24	692,81	0,0001266	keep

Conclusion: considering the difficult economic situation, the development of small cost-effective csc solution is reasonable. With a small production it is possible to fully satisfy the need for maintenance and repair of trucks. The proposed method can be used in determining the optimal nomenclature and the number of spare parts of automobile transportation companies.

UDC 622.35

Isabella Bianco[a], PhD student
Silvia Bobba[a], PhD student
Nina Karimbetova[b], PhD student
Svitlana Kobzar[b], language advisor
[a] Politecnico di Torino
[b] Zhytomyr State Technological University

ENVIRONMENTAL AND ECONOMIC JUSTIFICATION OF DIMENSION GRANITE CUTTING TECHNOLOGIES

KEYWORDS: dimension stone, cutting techniques, economic efficiency, quarry LCA.

INTRODUCTION: The morphological and geologic variability of stone deposits and natural differentiation of the materials give the reason for the huge spectrum of typologies of quarries that can be found also within the same geographical area. As a result, a range of technical solutions developed and adopted for stone quarrying is extremely wide [1]. The generalized productive cycle and main techniques employed at high-strength dimension stone quarries are shown in Fig. 1.

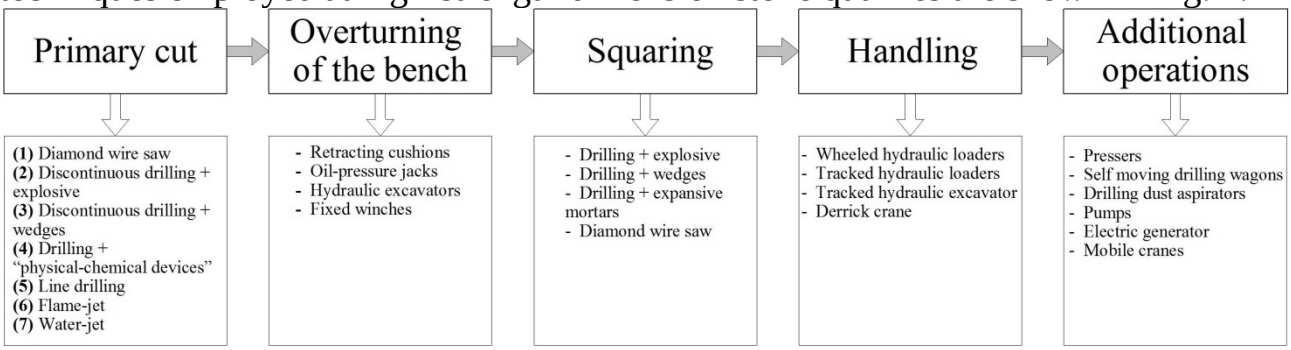


Figure 1. The productive cycle of granite quarrying and principal technologies currently in use

Hence, referring to Fig. 1, methods (4-7) are probably destined to be less and less employed due to a variety of reasons: rather long action time, high dependence on environment conditions, large volume and high value of drilling operations, necessity of a professional maintenance, notable environmental impact (in terms of energetic consumptions, elevated noisiness, aerodispersed dusts, exhausted gas), etc. Consequently, the most widespread techniques are (1-3) [1–3]. Nevertheless, there is a lack of explanation on the (1) and (2) techniques performance in monetary and environmental terms in aggregate. In hard stones quarries, some problems mainly related to the abrasiveness of the materials are limiting the use of diamond wire cutting technology (DWS). The combination (2) is probably the most traditional, consolidated and "cheap" technique in the exploitation of hard stones [1]. However, not only should low production costs be taken into account, but also the method's recovery; that is, how much of the quarried stone will be really exploitable in further processing [4].

The choice of explosive is made accidentally at many dimension stone quarries through a direct transfer of experience from other similar companies. This experience has not always been successful, so far powder or detonating cords are mainly used. Many explosives could not be widely used for dimension blocks extraction because of considerable fractures creation in the rock mass [5]. Consequently, the current study objective is to help producers in detecting the most appropriate techniques for dimension stone deposits both from the economic and environmental points of view.

METHODOLOGY: This paper aims to give some suggestions to evaluate which are the best techniques for an economically and environmentally sustainable supply chain of natural stone. The methodology proposed here is characterised by a comprehensive approach, which take into account the techniques from their real beginning (such as the production of tools) to their real ending (e.g. the treatment of wastes). This is the, so called, Life Cycle approach, which, extending the boundaries of the analyses, allows to understand whether changes in processes lead to real benefits or they just shift costs and/or environment impacts from one phase to another one. This methodological approach has been applied to aggregates production in SNAP project (http://www.snapsee.eu), a research study to enhance aggregates planning and management processes. According to SNAP manual, the main information to be collected is the extracted volume, types of employed materials, the waste production and the location. Since to make decisions about a good management of quarries, it is necessary to face multicriterion problems, the approach described here intends to give guidelines to help the understanding of this complex system, the subdivision into simpler issues and its re-composition and weighting to pursue the best techniques according to the specific conditions of the quarry.

Techniques employed at some Ukrainian and Italian dimension stone deposits were examined. Performance data of granite excavation techniques was measured, in order to determine which of them are the most economical. The primary cut of blocks was analysed using two alternative techniques: diamond wire cutting (1) and

discontinuous drilling + explosive (2). Operating and financial statements and material resources turnover of several granite deposits were analysed. The principal parameters of appraising the effectiveness of DWS technique are cutting speed (m^2/h) and service life (or productivity or yield of the wire, m^2/m). These two parameters have to be examined simultaneously to decide if the choice to use the wire as cutting technology is economical.

From the environmental point of view, the standardised method of Life Cycle Assessment (LCA) is employed as a tool to evaluate the environmental impacts of the stone processes. LCA analyses are regulated by the ISO 14040-44 standard and investigate all the physical exchanges between the production system and the environment. According to the standard, it is necessary to develop an inventory analysis to provide a detailed description of the inputs of raw materials and fuels into the system and the outputs of solid, liquid and gaseous wastes of the system. Since this is the base for the next phases of impact assessment and interpretation, it is important that inventory data of the processes taking place in quarries are as representative as possible. Nevertheless, in LCA databases (such as Ecoinvent, Thinkstep, ELCD), the availability of data related to quarries activities is quite limited. Therefore, the risk is to reach the results which are not really significant. To fill this gap, environmental investigations concerning the main quarrying techniques and tools are under development. The goal is to provide LCA databases with datasets which can be easily customised to the specific cases. There are ongoing investigations, for example, to define the environmental impact of diamond wires and explosives.

RESULTS: In order to better evaluate the economical and environmental efficiency of quarrying processes, the most common techniques are currently analysed. In this paper the results concerning the diamond wire use are shown.

With reference to 1 m^3 of stone, the use of explosives is cheaper than DWS technique. However, the problem to correctly appraise its unitary cost with reference to the volume of useful blocks produced must not be neglected (see Fig. 2). In comparison to (1), (2) causes a greater percentage of waste (7-10%) in contrast with 2-2.5% [1]. Since the commercial value of the stone grows with the processing progress, a less precise method could be advantageous only at the initial stages. Besides cheapness of the technique, other aspects have also to be considered: the safety, the operative flexibility and the adaptability to the characteristics of the rock, the minimization of the environmental impacts, etc.

From the environmental point of view, as explained in the previous paragraph, materials are investigated with a Life Cycle approach. It means that the diamond wire is considered throughout the phases of production, usage, treatment of wastes or disposal. Diamond wires comprise a metal rope on which synthetic diamond beads are mounted at regular intervals interposed by rubber or plastic annular layers. Diamond beads can be sintered or electroplated on a metal matrix, whose chemical composition often contains heavy metals such as Cobalt and Tungsten. This has direct implications on the wastes impact: dirt from cutting of stone materials usually presents a fraction of about 8% in weight of heavy metals, which are hazardous both for human beings and for environment. Since producers can choose among different

kinds of diamond wires and since different variables can be changed according to the extracted stones and the specific working conditions, a parametric LCA model is created. In this way it is possible to customise the environmental assessment according to the specific case, to reach more accurate environmental conclusions and to evaluate possibilities of improvement of the most critical phases.

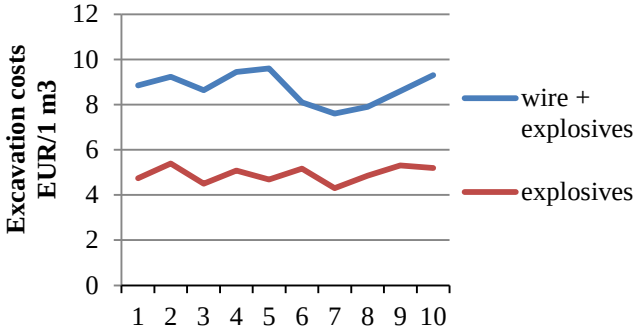


Figure 2. Costs for the excavation of 1 m^3 of dimension granite

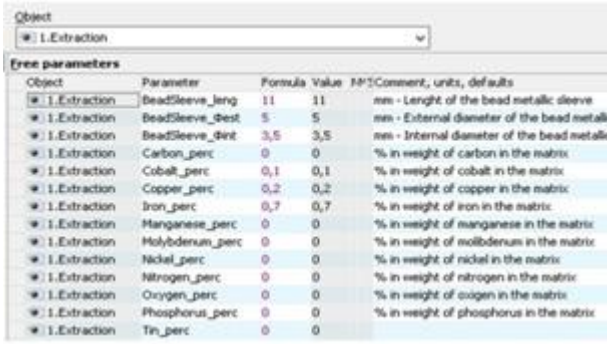


Figure 3. Parameters allowing to set the characteristics of diamond beads

As it can be seen in Fig. 3, quarry industries can change some parameters (such as the dimensions of diamond beads and the chemical composition of the metal alloy) according to the characteristics of the tools they use. This approach requires from the industries a major effort to monitor the characteristics of tools and the consumption of raw materials and energy, but it allows a better understanding of the environmental burdens and it gives indications of the improvements that could be more significant.

CONCLUSIONS: A good economic and environmental management of stone quarries requires the evaluation of many different aspects, sometimes contrasting ones. Different techniques of extraction are available in the stone sector, but the choice of the best ones is not obvious because, as in every complex system, it is necessary to take into account different parameters. Moreover, the context of the quarry could be quite variable and the natural stone not always has constant characteristics. For these reasons it is not possible to define the technique as the best one in absolute terms, but it is necessary to evaluate the specific cases. The life cycle approach can help to make appropriate decisions because of its analyses all along the stone industry processes. From the economical point of view, this approach allows to improve the efficiency of the production, while from the environmental point of view, it avoids shifting the impacts from one phase to another. The principal advantages of the employment of the wire saw are: versatility of use, reduced vibrations, noises, dusts and wastes. The greatest limits are represented by the necessity of a very precise preliminary drilling, the necessity of skilled manpower and of a continuous provisioning of water. Furthermore, cutting by a diamond wire could not be productively applied in case of highly fractured rocks, whereas other technologies are certainly more suitable and cheap. On the other hand, the exclusive use of a diamond wire is not currently practicable in hard stones, where operational problems and costs of production make this method non-competitive in comparison to traditional ones.

From the environmental point of view, the most common quarrying techniques and tools (such as the cutting with diamond wires) are under investigation in order to create customisable LCA datasets able to support the producers in their environmental assessment. Further research is planned in order to provide the stone producers with more LCA data and with a complete model able to fit specific productions.

REFERENCES

1. Cardu M., Lovera E. Optimising quarrying techniques and practices. 2nd ed. Athens: Laboratory of Metallurgy, National Technical University of Athens, 2002. 89 p.
2. Бычков Г.В. Направления повышения эффективности технологий добычи и обработки природного камня на Урале. Уральская государственная горно-геологическая академия, 2003. 385 р.
3. Уляков М.С. Обоснование комбинированного способа подготовки к выемке блочного высокопрочного камня. Магнитогорский государственный технический университет (МГТУ) имени Г.И. Носова, 2013. 152 р.
4. Mancini R. et al. Technological and Economic Evolution of Diamond Wire Use in Granite or Similar Stone Quarries // 17th Internationa Mining Congress and Exhibition of Turkey - IMCET2001. Ankara, Turkey, 2001. P. 543–548.
5. Hejkkila P., Jokinen O., Yulatalo K. Explosive charges effect on the development of explosive destruction of rocks. Otanieme, 1992. 21 p.

UDC 622.27

S. Kavun, student
V. Korobijchuk, Prof., research advisor
S. Kuriata, language advisor
Technologische Universität Zhytomyr

DIE ANALYSE DER FAKTOREN, DIE VERLUST VON ABDECKSTEIN, BEI DER VERWENDUNG VON DIAMANTENMASCHINEN BEEINFLUSSEN

Viele Technologien gibt es für die Förderung von Blocksteinen. Erwähnenswert ist, dass die Anlagen zur Förderung von Blöcken im schnellen Tempo, vervollkommnen werden und es ständig alternative Methoden zur Förderung geschaffen werden. Statt der traditionellen Technologien kommen die, neue die auf der Verwendung von mehr kostengünstigen Werkzeugen begründet werden.

Unter anderen Technologien kann man die solche Schneidemaschinen (Förderseilmaschinen, Schreibmaschinen, Ringfräser) nennen. Im Unterschied zu anderen Methoden, zum Beispiel, die Methode der gerichteten Abspaltung, bei der

Förderung von Blocksteinen auf diese Weise wird der monolithische Bergstock vollständig erhalten.

Man soll bezeichnen, dass unter den verbreiteten Schneidemaschinen die Seilmaschinen mit Diamanten Seilinstrument besonders aktiv benutzt werden. Mit der Zunahme des Wertes wird die Förderung von Blocksteinen mit diamantbestückten Seilen immer populär.

Die Förderung von Blocksteinen mit dieser Methode ermöglicht die Förderung unter schwierigen Bedingungen zu machen. Das heißt diese Methode ist hochproduktiv und einfach. Aber trotz der Vorteile gibt es eine Reihe von Nachteilen. Dazu gehören die Schwierigkeit des Schneidens beim Vorhandensein der Risse im Gestein, das Vorhandensein von härteren Einschlüssen und auch die Qualifikation des Bedienpersonals. Es hat zu bemerken, dass der Prozess des Schneidens mit diamantenbestückten Seil mit den Verlusten verbunden ist. Die qualitativen Verluste sind minimal und sie können nicht berücksichtig werden. Die quantitative Verluste werden die angegeben Faktoren beding:

1) Bergbau-und geologische Bedingungen der Lagerstätte,
2) Abmessungen des Monoliths,
3) Dicke des Diamantseiles.

Es wird offensichtlich, dass die Entstehung von quantitativen Verluste vor Vorbohrungen beding wird. Durch die ausgeschlossenen technologischen Eigenschaften der Maschine gibt es keine Möglichkeit, die horizontalen Loche in einer Ebene mit der vorhandenen Stufen Sohle zu machen, weil der Bohrloch höher als die Sohle von 0,05 bis 0,2 m, je nach Art der Bohrmaschine liegt.

In dessen Folge die Verbesserung in Bezug auf den vorherigen Sohlen Leisten (die Stufen) beobachtet, werden sie sich der Breite des Monoliths entsprechend gleich.

In diesem Fall werden die Höhenunterschiede auf einer Stufe in einem Lager von eins bis zehn Metern groß sein. Darum ist es notwendig unter Neigung von 1 bis 3º zum Horizont zu bohren und es erlaubt sich die Stufensohle zur horizontallen Ebene zu nähern. Daraus folgt, dass mit zunehmender Breite von Monolithen der Wert der Verluste der Sohle gestiegen wird, die wegen der Abweichungen der Bohrstange von der Senkrechte von 2-3 entwickelt ist.

Man muss sagen, es ist wichtig die Länge der Monolithen, weil wegen der technologischen Merkmale von Bohrmaschinen Vorsprunge an den Randseiten beobachtet werden. Ihre Bedeutung kann von 0,2 bis 0,4 m sein, in Folge dessen das nächste Monolith kleiner von 0,2 bis 0,4 m wird.

Um die Anzahl der senkrechten Stufen zu verkleinern, ist es nötig die Länge der Monolithen zu steigen. Die maximale Länge wird der Monolithen sowie durch die Länge der Stangen (für die modernen Bohrmaschinen beträgt die Gesamtlänge 10 m) als auch durch maximal mögliche Kontur von Diamantenseilen beschränkt.

Zur Verkleinerung der Verluste und zum Zunahmen des Blockertrags und um die Qualität zu verbessern, muss man der Grund des Entstehens der quantitativen

Verluste bei der Förderung von Steinen mit den Diamantenseilen geforscht sein und muss optimale Länge der Monolithen festgestellt sein. Bei der Methode der Förderung von Blocksteinen wird die Qualität von Blocks erhöht und dabei werden die Verluste reduziert.

Eine weitere Untersuchung dieser Frage ermöglicht die Verluste zu reduzieren und effizientere Nutzung von Rohstoffen zu verwenden.

UDC 679.8.022

Y. Kovalchuk, Master student
V. Shamrai, PhD student, research advisor
S. Sukhovetska, language advisor,
Zhytomyr State Technological University

THE STUDY OF VARIOUS PROCESSES INFLUENCE ON THE PERCEPTION OF NATURAL FACING STONE EXTERIOR

Background. Today, natural facing stone, as a qualitative and durable natural building material, is used as a decorative material for buildings decoration. That`s why, besides physical and mechanical properties, its aesthetic characteristics are important when choosing a place to use.

Mineral composition and structure of stone, as well as natural stone features change during the extraction of natural stone blocks at different horizons of a quarry. The differences in the plates structure, color and lightness are clearly observed at surface-tooling of plates made of various natural stone blocks that were extracted at different depths. When diverse in color and lightness stone is used for facing of buildings and structures, sensory difference in the perception of the visual analyzer exists. Thus, when facing buildings or other constructions with natural stone, especially when these works are of big volume, the problem of selection of plain plates appears, as far as the same type of stone has different lightness at the same surface-tooling [1].

Technological processing, as well as many other different factors can affect a stone exterior perception depending on the type and the place of application. Therefore, we should investigate the impact of these factors on the perception of the natural stone surface.

The main material of the research.

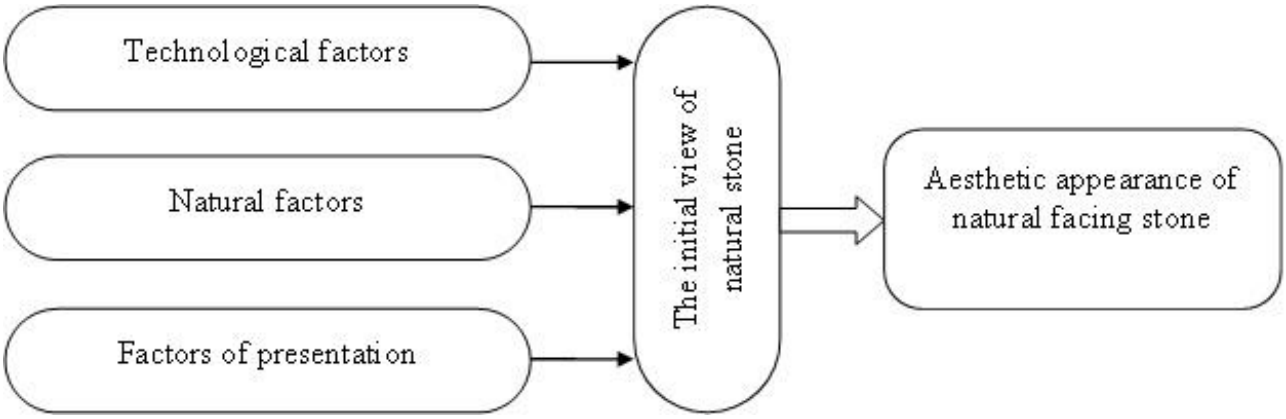
The products made of natural facing stones can be classified by many attributes, such as: the type, the function, the geological origin and mineralogical composition of initial rocks, basic properties, the method of manufacture, the degree of decorativeness and the character of a stone processing.

Facing stone is produced for internal and external facing work. Facing works and facing materials are divided into:

• Exterior (facades);
• Internal (facing surfaces of the interior: walls, partitions, floors).

The exterior of facing stone. There is a large number of processes that can affect the appearance of decorative stone. Under the term "exterior of natural stone" we mean its front surface texture, pattern, color, rock structure.

Fig. 1. The influence of various factors on the aesthetic appearance of facing stone



The aesthetic appearance of a stone depends not only on the initial appearance of a stone, but on other factors (Fig. 1). Primarily, the technology of natural facing stone processing positively affects the quality of a stone appearance, i.e.: it emphasizes the structure and the patterns of natural stone, saturates its color. In its turn, processing technology depends on the way natural stone is used, providing a proper surface texture of natural stone, which determines the impact of technological factors on the quality of stone appearance [2].

Natural factors are connected with temperature, humidity, dusty air, such precipitation as rain, snow, and other accelerated effects.

Factors of presentation include the location, type and lighting of a construction which is being faced.

Conclusions

Natural and technological factors, as well as the initial appearance of stone are more understood today. Factors of presentation require more detailed study, because the dependence of aesthetic appearance of the natural facing stone on the location, height, type and lighting of a construction is significant. Therefore, the development of the research and more detailed study of this problem will allow using natural facing stone efficiently.

REFERENCES

1. Shamrai, V., Korobiychuk, V. (2014). Influence of grinding-polishing of natural stone on its shine and lightness shades. Eastern-European Journal Of Enterprise Technologies, 5(5(71)), 56-60.
2. Bakka, M. T., Korobiichuk, V. V., Zubchenko, E. A. (2006). Processing of natural stone: study guide. Zhytomyr, ZSTU, 438.

UDC 504.4 (477.42)

M. Kuklich, Master student
T. Yelnikova, PhD in Eng., As. Prof., research advisor
N. Kurnosova, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

IMPACT OF BIOGENICS ON EUTROPHICATION PROCESSES IN THE TETERIV RIVER RESERVOIRS IN ZHYTOMYR REGION

The problem of water resources protection in Zhytomir region is extremely urgent nowadays. The phytoplankton is one of the important indicators of the ecological state of an aquatic environment. This paper deals with the dynamics of phytoplankton growth and eutrophication processes and their impact on water quality in the reservoirs of the river Teteriv. Phytoplankters are of many species, mostly oxygen-evolving prokaryotic blue-green algae (Cyanophycota) and Prochlorophycota and eukaryotic algae. The eukaryote groups of greatest importance are the Cryptophyceae (cryptophytes). Dinophyceae (dinoflagellates), Chlorophycota (green algae), Euglenophycota (euglenoids), Bacillariophyceae (diatoms) and Chrysophyceae and Haptophyceae (yellow-green or golden-yellow algae).

The research was carried out in the Vidsichne Intake and the Denyshi Reservoir. The length of the river Teteriv is 365 km, the basin area is 15,300 km^2. The study was conducted between January and December 2015. We determined the peculiarities of phytoplankton formation and development as well as methods for finding quantitative and qualitative indicators of eutrophication. A study of dissolved oxygen content was made. The results of the investigation and recommendations for preventing eutrophication in the reservoirs were presented. Our research showed that a significant increase in algae biomass led to biological contamination of the reservoirs under our consideration and resulted in deterioration of water quality: its transparency, color, acidity and amount of toxic compounds.

The study showed that the phytoplankton in the reservoirs was presented by diatoms, euglenophyta, dinoflagellata, blue-green, green and golden algae. We observed the most abundant types of algae: blue-green algae (93,6%), diatoms (3,4%) and green algae (2,8%). Euglenophyta, dinoflagellata and golden algae were found in negligible quantity and did not influence the indicators significantly.

We determined seasonable periodicity of the phytoplankton growth for each type. The seasonable changes in the phytoplankton growth are presented in Fig.1.

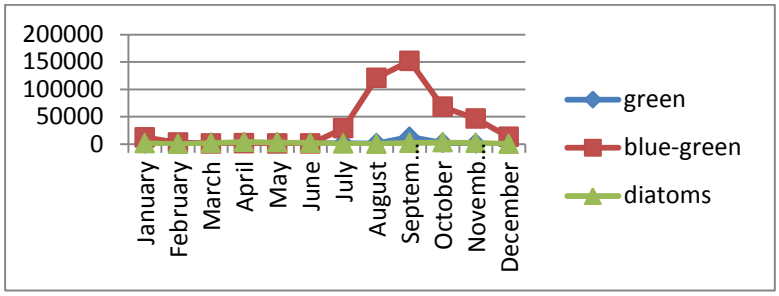


Fig.1. Dynamics of algae growth

The figure shows that algae have an intensive reproduction only during certain periods of the year. For example the maximum of blue-green algae was observed in August in the Denyshi Reservoir and in September in the Vidsichne Intake. The green algae first occurred in late May and reached their mass reproduction in June. Diatoms were observed in the reservoirs all over the year and had two periods of mass reproduction. The first period was between April and June and the second one lasted from September to November.

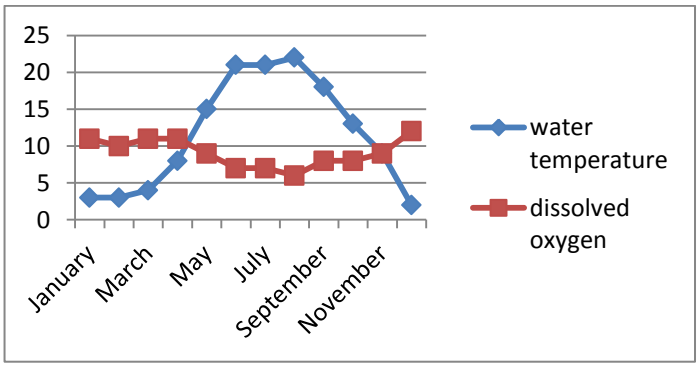


Fig.2. Average water temperature and dissolved oxygen concentration

Fig. 2. shows a high rise of temperature in the period of the intensive growth of blue green algae in summer months. We can also observe a slight decrease in dissolved oxygen concentration during the period of blue green algae growth (April-October). This reduction in the dissolved oxygen concentration is a sign of eutrophication processes. There is also an insignificant reduction in diatoms population and an increase in green algae population.

We can conclude that it is the algal toxins released in the periods of intensive algae reproduction and growth that cause water contamination and eutrophication in the reservoirs of the Teteriv River. The activities to reduce algae blooms in the Teteriv River reservoirs are the following:

- to form water conservation zones for the reservoirs;
- to aerate the reservoirs to avoid oxygen depletion;
- to use algicide in order to reduce algae growth;
- to remove organic excess substances from the reservoirs.

UDC: 622.232.5

R. Kutscher, Student
O. Tolkatsch, Kandidat der technischenWissenschaften,
wissenschaftlicher Führer
S. Kuriata, Anraten der Sprache
Technologische Universität Zhytomyr

SELTSAMKEITEN DER ANWENDUNG DES PULSIERENDEN AUFSETZENS DES HYDROMONITORS BEI AUSARBEITUNG DER LEHMUMFANGREICH ARTEN

In der Ukraine ist die mächtige Rohstoffbasis des Titans geschaffen. Die summarischen Vorräte und die perspektivischen Ressourcen der erkundeten und zur Untersuchung vorbereiteten Vorkommen gewährleisten die Bedürfnisse der Industrie und das bedeutende Exportpotential vollständig. Die Förderung der Erze mit dem Erhalten der Titankonzentrate und ihre Überarbeitung verwirklichen den wesentlichen Einfluss auf die Entwicklung der Wirtschaft der Ukraine insgesamt. Eines des mächtigen Bergwerks befindet sich im Zhytomyrer Gebiet. Der Bergwerk Meshyritschka ist im Irschansker Bezirk, auf den sich die Förderung und die Verarbeitung von Titaneisen auf das Hydroabbauverfahren und mit Hilfe von Kabelbaggern verwirklicht werden. Auf dem gegebenen Bergwerk treffen sich die dichten Tone, die der Förderung stören. Deshalb erscheint die Notwendigkeit nach der Entwicklung der technischen Lösungen, die die Technologie der Förderung verbessert werden.

Das Problem der Zerstörung der dichten Tonmassive war und ist eines der wichtigsten Probleme der Bergproduktion. Deswegen werden bei der Entwicklung der Lehmumfangreichen Gestein die pulsierenden Hydromonitoraufsätze verwendet. Der Hydromonitoraufsatz hat zwei Düsen Köpfe, erste ist auf der Vorderstirnseite, und zweite ist auf der Seitenoberfläche des Rumpfes aufgestellt. Für die Bildung des pulsierenden Stroms der Flüssigkeit wird im Kanal des Rumpfes die Einrichtung der Unterbrechung des Stroms aufgestellt. Die Einrichtung enthält eine Scheibe, die auf der Achse gefestigt und ihre Seitenwände haben Öffnungen. Für das Drehen des Scheibenunterbrechers des Stroms ist Turbine gefestigt, die als das Rad darstellt, und aus der Nabe und der Schaufel des Kranzes bestehen. Die Achse, wo die Scheibe und die Nabe sind, werden in den Lagern des Gleitens festgestellt, und ein von denen ist im Rumpf des Aufsatzes der Vorderstirnseite, sondern anderer ist im zentralen Teil der Stütze gefestigt. Der Lager hat eine Ringform mit den Rändern der Härte, mit dem äußerlichen Radius dem Nasenring ähnlich ist. Die Stütze ist im Nasenring vom Schnitzring festgelegt. Beim Arbeitsprozess erzwingt die Flüssigkeit, die von der Pumpe des hohen Drucks im Rumpf des Aufsatzes verlegt wird, sich die Turbine drehen lässt. Die Achse mit dem Scheibenunterbrecher dreht sich auch und Scheibensektoren überdecken periodisch die Eingangsöffnungen. Als Resultat gehen aus dem Vorder- und Seitendüsen die pulsierenden Ströme der Flüssigkeit hinaus, die

die Zerstörung des Massives beeinflussen. Dabei wird die Intensität der Hydrozerstörungen auf den Kosten vom dynamischen Einfluss der pulsierenden Ströme auf das Massiv erhöht, worin das Netz der Mikrorisse geschaffen werden, die die Festigkeit des Materials verringern. Für die Bildung des Kanals im bearbeiteten Massiv wird der Rumpf des Aufsatzes ins Drehen um die eigene Achse gebracht und hat die axiale Abgabe in der Richtung der Zerstörung des Massiven. So lässt der summarische Einfluss der pulsierenden Ströme auf die Oberfläche des Materials zu der Bearbeitungsproduktivität der Oberfläche des Materials erhöhen. Die Produktivität der Förderung auf Weise des Hydromonitors vom Druck des Wassers hängt von dem Aufsatz in bedeutendem Maße ab. Im allgemeinen Blick kann diese Abhängigkeit von der Angleichung vorgestellt sein:

$$П = cP^n,$$

П – die Produktivität des Hydromonitorstrahles,

c – der Koeffizient, der die Bergfaktoren berücksichtigt,

P – der Druck im Kontakt des Strahles mit dem Massiv,

n – die Kennziffer der Stufe.

Für die Versorgung der vollsten Nutzung der Vorräte ist es notwendig, dass alle Prozesse, die mit der Beute verbunden sind, geschahen in einer bestimmten Reihenfolge unter Ausnutzung des am meisten produktiven Transportes und der Ausrüstung nach der vervollkommneten Technologie der Arbeiten, die auf den letzten Errungenschaften der Wissenschaft und die Produktion gegründet wird. Deshalb ist es in der nachfolgenden Technologie der Beute empfehlenswert, die pulsierenden Aufsätze des Hydromonitors zu verwenden. Die Anwendung dieser Aufsätze wird die Produktivität der Beute erhöhen.

UDC 629.662

V. Levchuk, student
I. Cherepanska, PhD in Engr., As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

MEASUREMENT OF FUEL CONSUMPTION IN INTERNAL COMBUSTION ENGINES

In the modern world the most popular means of transport is a car. The commonest problem for car owners is fuel consumption precise measuring. Those measuring systems that are installed in ICE (here & forward – internal combustion engine) of most vehicles can give us very approximate values.

There are two questions which our topic arises: What is the use of precise fuel consumption measuring? What flow meter meets the requirements of our research?

Answering the first question let us consider the situation when you are almost out of fuel and you don't know whether you will be able to get to the nearest gas station. With the device that we offer you will know what distance your car can go exactly.

Before describing our project we must consider the definition of flow measurement devices.

Flow measurement is the quantification of bulk fluid movement. Flow can be measured in a variety of ways. Positive-displacement flow meters accumulate a fixed volume of fluid and then count the number of times the volume is filled to measure flow. Other flow measurement methods rely on forces produced by the flowing stream as it overcomes a known constriction, to indirectly calculate flow. Flow may be measured by measuring the velocity of fluid over a known area [1].

Our research is dedicated to measuring the most popular type of fuels – petrol. While studying various types of liquid flow meters we took into account the fact that not all of them can measure petrol consumption because of viscosity. After the detailed analysis of the topic, the examples of using flow meters in ICE were given: volumetric counters of direct influence, ultrasonic flow meters, vortex flow meters, coriolis flow meters, level to flow counters. We compared all above mentioned devices and made an inference that coriolis flow meter better suits our requirements.

A mass or coriolis flow meter, also known as an inertial flow meter, is a device that measures mass flow rate of the fluid traveling through a tube [2]. Using the Coriolis effect that causes a laterally vibrating tube to distort, the direct measurement of mass flow can be obtained in this type of flow meter [1]. This device has lots of advantages including high accuracy and long duration of usage without calibrating. Also there is a huge variety of sizes and volumes that gives us possibility to plug it into ICE.

Next step in our research was to carry out an experiment with ICE that can give us real results. We found the coriolis flow meter that can be installed into the fuel supply system of the chosen ICE. Using special software we made simulation of ICE work and generated ten random meanings of the flow meter in the set range for subsequent calculations. The results that we obtained confirmed nominal accuracy of the chosen flow meter.

All investigations that were done made us conclude that usage of coriolis flow meter is expediential and profitable.

REFERENCES

1. Flow measurement [Електронний ресурс] Access mode https://en.wikipedia.org/wiki/Flow_measurement

2. Flow measurement [Електронний ресурс] Access mode https://en.wikipedia.org/wiki/Flow_measurement

UDC 656.1

O. Levkivskyi, Master student
O. Kravchenko, Dr.of Engr., Prof., research adviser
V. Osypov, Deputy Director General
Municipal corporation "Kievavtodor"
I. Melnychenko, lecturer, language advisor
Zhytomyr State Technological University

THE RESEARCH OF POSSIBILITY OF USING RUBBER ELEVATED PEDESTRIAN CROSSING

The probability to get in road accident with lethal outcome in Ukraine is five times higher than in Western European countries. The main causes of road accidents that lead to deaths are: inappropriate speed (49%); coming out onto oncoming lane (20%). The experience of many countries shows that the installation of road signs that limit the speed does not give the desired effect without additional measures.

In the speed range of 40 - 60 km per h there is a high probability of death of a pedestrian. The explanation is that when emergency braking (on dry surfaces) vehicle moving:

- at a speed of 40 km per hour it will stop through 20 meters;
- at a speed of 60 km per hour - through 20 m vehicle is still moving at a speed of 55 km per hour.

In some countries, the combination of trapezoidal hamp with pedestrian crossing is widely practiced, forming the so-called elevated pedestrian crossing. Its goal is additional safety for pedestrians. Hamps are artificial inequalities on the driveway, arranged to hold the speed of the vehicles in areas of potential danger of road accident. The use of hamps can provide a reduction in the number of road accidents to 60%. Adopting the progressive world practices it is offered to use the elevated pedestrian crossings made of rubber.

When making and arranging the elevated pedestrian crossing the following technical conditions must be taken into consideration:

- the process of vehicle tracking on the increased inequality and moving out from it ;
- physical and mechanical features of the rubber type of coating crossing.

There is a hit on the obstacle when rolling wheel meets with the increase in coverage accompanied by compression springs and tires (or strut). Impact force depends on the height and form of obstacles, wheel elasticity and speed. The higher the obstacle is, the more intense is the second hit in the fall of wheels on the pavement after the descent of the obstacles. When hitting the pavement tire is compressed. As the tire is being compressed the pressure on pavement increases. The greater rigidity tire module is, the shorter the stroke is and therefore higher speed and compression acceleration are. If we denote the maximum compressing of the tire

when hitting on coating u_{max}, so the maximum dynamic force applied to coating at tire stiffness modules k

$$G\partial = ku_{\max}. \quad (1)$$

When considering hit on the hard road pavements it is possible to neglect its deformation, comparatively small to the deformation of the tire, so the module of pavement hardness is considered to be large. In this case, the energy acquired by wheel at compression on $u_{max}=(u+\Delta)$, equal $k(u+\Delta)$ x $(u+\Delta)$, should be equal to the energy of wheel drop in cavity

$$G = (h+u), \quad (2)$$

where h – a deep of cavity.

So,

$$u = \sqrt{\frac{2Gh}{k}} - \Delta^2, \quad (3)$$

where $\Delta = \frac{G}{k}$ - static pressure of tire;

u – impact additional tire pressure.

A measure of energy loss can serve as a coefficient of impact restitution. The coefficient of impact restitution ranges from 0.60 to 0.82 by changing the air pressure in the chamber in the range of 0 to 5 at for lorry tires and hard surfaces. Thus, taking into account the impact energy loss the wheel against coating, the value of dynamic compression of the tire,

$$u = e\sqrt{\frac{2Gh}{k}} - \Delta^2, \quad (4)$$

and maximum acceleration of wheel, that falling from height h

$$w_{\max} = n^2 u_{\max} = \frac{kg}{G} e\sqrt{\frac{2Gh}{k}} - \Delta^2 = eg\sqrt{\frac{2kh}{G}} - 1, \quad (5)$$

where n – the circular frequency of natural oscillations of the wheel.

Through the emergence of dynamic forces when driving on uneven road surface wheel pressure on pavements is heavier than at the static impact. In determining the dynamic coefficient as the ratio of sum static and dynamic power to the static, we get the expression for wheel weights G, falling in pothole deep h

$$\gamma = 1 + e\sqrt{\frac{2kh}{G}} - 1. \quad (6)$$

The criterion for assessing longitudinal stability is the critical angle of ascent overcome with constant speed without slipping driving wheels and is given by:

$$\alpha = arctg\left(\frac{a \cdot \phi}{L - h_{ц.т.} \cdot \phi}\right), \quad (7)$$

where a - distance from the center of gravity of the vehicle to its front axle, m;

L - base of car, m.

Performed calculations for the vehicle when empty and laden at different values of coefficients φ was summarized in the table. 1.

Table 1

The critical angle of ascent

The critical angle of ascent,°	The coefficient of tire adhesion	
	Surface dry - 0,6	Surface wet - 0,5
Without load	44	37
With full load	45	39

The minimum critical angle of ascent for asphalt and cement-concrete cover is minimum, and it is the maximum at ice. Table 2 shows the design parameters of elevated pedestrian crossings and the desired speed limit of vehicles.

Table 2

Design options elevated pedestrian crossings and the desired speed limit of vehicles

Maximum speed, indicated on the sign, km / h.	Wavelike profile			Trapezoidal profile			
	Length (L), m	The maximum height of the crest (H), m	The radius of the curved surface (R), m	The length of the horizontal platform (Lr), m	The length of the sloping section (L_H), m	The maximum height of the crest (H),m	The angle of the inclined surface, %
20	3,0-3,5	0,07	11,0-15,0	2,0-2,5	1,0-1,15	0,07	14,1
30	4,0-4,5	0,07	20,0-25,0	3,0-5,0	1,0-1,4	0,07	10,0
40	6,25-6,75	0,07	48,0-57,0	3,0-5,0	1,75-2,25	0,07	6,0

Conclusion: the reduction of vehicle speed by applying elevated rubber pedestrian crossings will reduce the number of road accidents.

UDC: 614.251:630

V. Melnyk, PhD student
T. Kurbet, PhD in Agr. Sc., As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

FEATURES OF FORESTRY MANAGEMENT ON RADIOACTIVELY CONTAMINATED TERRITORIES

Scientifically grounded system and rational organization of forestry take into consideration zonal characteristics caused by various natural and economic factors. This gives the possibility to perform all forestry management measures differentially. Rational organization of forestry is only possible through an integrated forest zoning and considering regional features. Within each forest area the types of forest uses are established for each forest area considering purpose, fire-prevention and sanitary conditions, the level of radioactive contamination of vegetation and soil, the possibility of ensuring radiation and environmental safety.

Radioactive contamination of the territory by the radioactive emission of Chernobyl NPP is unprecedented in the world nuclear energy usage. It is necessary to note that the results of the studies of the state forest fund of Ukraine (3.2 million hectares) in 1991-1992 showed that 39% of forest areas had radioactive contamination of soil by ^{137}Cs more than 1 Ci/km^2. Therefore, forestry activities in these areas have been limited, and on the area of 157 thousand hectares all types of forest operations were banned because of high levels of radioactive contamination by ^{137}Cs (more than 15 Ci/km^2).

To date, the main aim of forestry management is to obtain objective information about the radiation situation in forests, about the presence of radionuclides in forest products, about radiation situation in the workplace and staff radiation exposure. At the same time, economic efficiency of forestries on the contaminated areas is yet important. After the Chernobyl accident investigators took a number of organizational and practical measures to study the radiation situation in forests.

The scientists have developed guidelines on forestry management in conditions of radioactive contamination. These recommendations give the possibility to conduct forestry activities using differentiated approach under special regulations. The planning of the forestry management is carried out within selected zones of radioactive contamination using the results of radiation monitoring: the density of radioactive contamination of soil by ^{137}Cs, dose of gamma radiation, concentration of ^{137}Cs in forest products, as well as considering the type of site conditions, composition of tree species, their age, technology of works, labor protection and radiation safety.

The research allowed to divide the forestry enterprises of Ukraine according to their radioactive contamination level and the ability to use forest products into the following categories:

- group 1 – forestries, where plantations with ^{137}Cs soil contamination more than 1 Ci/km^2 are not found. Mode of forestry management on these areas remains traditional. Control of products for contamination in forestries and hunting grounds of this area is not performed.
- group 2 – forestries of forest-steppe and steppe zones of Ukraine, where forest areas are found with ^{137}Cs soil contamination up to 10 Ci/km^2. Due to rich gray and dark gray forest soils and ashed black earth in these forests, a significant accumulation of radionuclides in forest products is not foreseen. These forestries should focus on monitoring the contamination of non-timber products.
- group 3 – forestries of Polissia regions where there are forest areas with ^{137}Cs soil contamination up to 5 Ci/km^2. In these forestries a significant radioactive contamination of forest products is not predicted either, but radiation monitoring should cover all aspects of production, especially harvesting of non-timber forest products.
- group 4 – forestries of Polissia regions with forest areas, where ^{137}Cs soil contamination density exceeds 5 Ci/km^2. Due to the large mosaic of radioactive contamination of forest areas and features of the dynamics of radioactive contamination of products, these forestries should conduct regular tight radiation monitoring of all batches of products, and make changes to the system of forestry management.

Since Ukraine has intense, multipurpose forestry related to the exploitation of many vegetative and animal species, there is a need for detailed forest zoning according to the density of radioactive contamination. The basis for such kind of zoning is the need for working hours regulation, using the forest products and taking forest-protection measures. In accordance with current data on ^{137}Cs contamination of forests and forest products, forests are divided into three main zones, and each of them is divided into subzones (Table 1).

Table 1

Distribution of forests by ^{137}Cs soil contamination into zones and regulating measures

Zone	Subzone	Density of ^{137}Cs soil contamination, (Ci/km^2)	Regulating measures
1	a	15,01-30,0	Control of working hours during emergency forest-protection operations
	b	>30,0	Development of special regime of fire-protection, forest-protection work
2	a	5,01-7,00	Limited use of fuel wood and lighter wood
	b	7,01-10,00	Limited use of treated timber, timber for storing food and household products
	c	10,01-15,00	Limited use of wood for other purposes
3	a	1,01-2,00	Limited use of wild edible mushrooms, berries and some herbs (heather, cowberry, buckwheat)

	b	2,01-5,00	Limited use of medicinal plants and berries, forest grasslands hay, coniferous paw

Thus, the developed grouping of forestries and further zoning of forests, along with the proved dependencies between the density of radioactive contamination of soil and the content of radionuclides in different forest products, are effective measures for forest management regulation on the areas contaminated as a reult of the Chernobyl accident.

Specificity of forestry on the contaminated areas should take into account such important factors as modification of the radiation environment on the basis of radionuclides decay, a large mosaic of forest ecosystems radioactive contamination, perculiarities of radionuclide migration and their accumulation by forest products in different site conditions, etc. All these factors require constant radiation monitoring of products and scientifically substantiated forestry management on the contaminated areas.

UDC 622.1

N. Mergurieva, Master student
V. Kotenko, PhD in Engr., As. Prof., research advisor
S. Sukhovetska, language advisor
Zhytomyr State Technological University

GEOMETRIZATION OF MINERAL DEPOSITS

Actuality of the topic. Conduction of geometrization ensures the accuracy and appropriateness of a deposit development using the most efficient machines and systems. Geometrization of mineral deposits gives a possibility to predict the accurate location and time for mining. To create a complete picture of exploration and mining planning, results of study are depicted in graphic documentation of structural and qualitative characteristics of mineral deposits.

The goal of this paper is to identify the main regularities and characteristics of a deposit location, qualitative features of a deposit and the analysis of the research results.

The analysis of the study. The experience of working out deposits shows that the problem of geometrization study is topical for the whole period of deposit exploitation. It is important to consider new deposit parameters which are critical and can affect the state of the rock mass at each stage of a field working.

A significant contribution to the problem of geometrization was made by a well known scientists M.Leontovskyy, V.Bauman and P.Sobolevskyy. Further development of these issues was continued by their students and followers: I. Ushakov, P. Ryzhov, Z. Nyzhuretskyy, V. Bukrynskyy, V. Hudkov, H. Vilesov, D. Kazakovskyy, O. Trofymov, V. Kalynchenko, V. Kuzmin and others.

Types of geometrization of mineral resources. Geological indicators are divided into features that characterize the shape of the rock mass, its properties and processes in the subsoil.

Following types of geometrization are distinguished depending on the field of subsoil study: geometrization of the form of mineral deposits and the conditions of their occurrence; geometrization of physico-chemical and technological properties of deposits and inside rocks; geometrization processes that occurred and are occurring in subsoil.

Depending on the stage of the field study, specific problems of mining and geometrical drawings, as well as regional and detailed prospecting, and operational geometrization of fields are distinguished.

The regional geometrization is carried out at the scale from 1: 50,000 to 1: 500,000. The data on prospecting, as well as space, aerophotographic, geological and geophysical surveys are taken into account. It allows making generalizations and general forecasts, and identifying areas which are perspective for further exploration.

Detailed stakeout geometrization is carried out at scales from 1: 5,000 to 1: 50,000 on the basis of detailed prospecting, as well as geological, structural, geophysical and geological surveys. Various mining-geometric graphs of the conditions of a deposit occurrence and the raw material contained in a deposit are drawn at this stage. Geometrization data are taken into account when evaluating deposits, estimating resources and planning mining enterprise.

Operating geometrization of a deposit is carried out at a scale of 1: 100- 1: 5000. It is performed on the basis of detailed prospecting and geological information obtained when performing preparation works and cleaning of mining workings.

Operating geometrization allows to reveal structural and qualitative patterns which helps to build forecasts on deposits and on their rational development.

The methodology of geometrization considers techniques and methods of detection and imaging of field form and properties, the conditions of a field occurrence and the processes occurring in the depths.

The source of information is the exploration of a deposit. The basic method of exploration is testing. The results of a deposit testing by boring wells should be considered as a system of irregularly spaced samples, which enclose cavities and layers of other rocks.

Different methods of creating topographical surfaces are required to gather information about the heterogeneity of the tests on the area, the distribution and spread of the indicators values of the minerals layer.

For example, to build hypsometric plan of the layer following materials are used:

- ✓ Geological map of exposed layers at the Earth's surface or in deposits at the scale of 1: 10000. The grid, the horizontal surface, as well as line cuts and exploratory wells are drawn;
- ✓ Geological sections at the scale of 1: 10,000;

- ✓ Results of geological surveys of exploratory wells;
- ✓ Normal stratigraphic sections of the rock strata at the scale of 1: 2000.

Thus, geometrization of a deposit enables a deposit modeling using information obtained in the exploration, and the development with regard to technological requirements of exploitation. A comprehensive study of qualitative indicators which shows relationships between indicators can be carried out by geometrization methods and qualimetry of mineral resources.

REFERENCES

1. Геометризація родовищ корисних копалин (Практикум): Навч. посіб. для студ. напр. 0903 "Гірництво" спец. 090307 "маркшейдерська справа" / Г. О. Антипенко, Т. Г. Ніколаєва. Дніпропетровськ : НГУ, 2002. - 113 с.
2. Бакка М.Т., Редчиць В.С., Наральник Я.В., Геометризація родовищ корисних копалин: Навчальний посібник. –Житомир: ЖІТІ, 2002. - 180 с.

UDC 630:574

O. Moshkovska, Master student
S. Sukhovetska, language advisor,
Zhytomyr State Technological University

RESTORATION OF FORESTRY ACTIVITIES IN CONTAMINATED BY RADIONUCLIDES FORESTS IN STATE ENTERPRISE "OVRUCH FORESTRY"

The current radiation situation on SE "Ovruch forestry" forest lands contaminated by accidental radioactive release at Chernobyl NPP was considered. It was proved that the forests territories with contamination density of 137 Cs <1 Ci / km2 increased by 5378 hectares due to auto rehabilitation processes in forest ecosystems for almost 30 years after radiation contamination of SE "Ovruch forestry" forests.

Involvement of the contaminated forest lands into production should be done after their rehabilitation.

Keywords: forest ecosystem, radioactive contamination, forest land, rehabilitation methodology.

According to the data, almost 40,945 hectares of SE "Ovruch forestry" forests are considered to be a zone of radioactive contamination after Chernobyl accident. Current radiation situation in the contaminated forests is caused by a complex of factors that determine the intensity of the biological cycle of radionuclides in ecosystems. The main factors are: radiation contamination density of soil, composition of radionuclides, physical and agrochemical properties of soils.

The radiation situation in the contaminated territories significantly changed for the last 30 years after Chernobyl accident. The changes of radiation situation in

forests were caused by two factors: under the influence of physical decay of such short-lived and biologically significant radioactive elements as 137 Cs and 90 Sr; due to redistribution of radionuclides between components of forest ecosystems and irreversible fixing in the soil absorbing complex.

Compared to 1991, the territory of forest lands with 137 Cs contamination density of more than 1 Ci/km2 decreased by 5,378 hectares in 2015. Now, all forestry activities there can be spent without restrictions. Forest territory that belonged to the zone of absolute resettlement (> 15 Ci/km2) also decreased by 2,793 hectares. The first-priority forestry activities such as monitoring of working hours when performing urgent forest-protection works and developing a special mode of fire-prevention and forest-protection works should be performed at these areas. Forest lands of a zone of guaranteed or voluntary resettlement (5-15 Ci/km2) decreased by 13,372 hectares. Now, the measures to limit the use of fuel wood and treated timber, as well as timber for storing food and household products and wood for other purposes must be conducted. Finally, the forest territory with intensified radiation monitoring increased by 8,469 hectares. These lands are required to carry out measures to limit the usage of mushrooms and some herbs, as well as to limit the usage of medicinal plants, berries and hay from forest grasslands.

Mentioned above changes of radiation situation in contaminated forests occurred naturally due to the physical decay of radionuclides and their redistribution between components of forest ecosystems. Therefore, these changes of radiation situation in forest ecosystems can be considered as auto rehabilitation as far as they occurred without human intervention.

Now, it can be asserted that the radiation situation in contaminated forests is stable and predictable, which gives reason to start rehabilitation of the contaminated forest lands.

Conclusions:

1. According to the data, almost 40,945 hectares of SE "Ovruch forestry" lands are contaminated by accidental release after Chernobyl accident. But, with a time span, the radionuclides redistribution between litter and soil occurs due to the radionuclides vertical migration in contaminated forest ecosystems.

2. The radiation situation in the contaminated territories significantly changed for the last 30 years after Chernobyl accident. Compared to 1991, the territory of contaminated forests with 137Cs contamination density of > 1 Ci/km2 decreased by 5,378 hectares under the influence of forest ecosystem self-cleaning (auto rehabilitation). Today, all forestry activities can be carried out without restrictions.

3. Rehabilitation of the contaminated forests can occur in two ways: due to auto rehabilitation; and through active human intervention, that is, by the implementation of measures of gradual restoration of forest lands for their intended purpose and the gradual renewal of the forest products usage in forest lands that are contaminated by radionuclides.

UDC 627.514, 627.515

N. Nemolovskaya, assistant, postgraduate student
S. Klimov, PhD in Engineering, As. Prof., research advisor
A. Litvinchuk, Senior lecturer, language advisor
National University of Water and Environmental Engineering, Rivne

RECONSTRUCTION OF SOIL DAMS WITH THE USE OF SOIL MIXTURE

Protection of the most valuable areas and settlements by means of embankment with protective dams has found wide use in Ukraine.

In particular, when creating the Dnieper cascade of reservoirs, 300,6 km of dams were built for the protection of 197 thous. ha with 131 settlements and 600 thous. residents [1]. These dams operate in the conditions of constant water head making their utilization more difficult as compared to the flood protective dams. Most dams have been used for about 50 years and are in the near-destruction state. Reconstruction of these dams is necessary not only to avoid potentially catastrophic flooding of large areas, but also to reduce annual losses from crop shortfall due to the flooding of farmland accounting for about 1 570 mln.hrn., as well as to reduce the operating costs of pumping stations exploitation at Dnieper basin management of water resources, which annually pump 2…3 km^3 of water [1].

Another object is the reconstruction of the sludge pit dams of Bortnytska aeration station planned in 2016, which was recognized to be dangerous as far back as in 1989. During the year 2015 the hydraulic fill of the territory in the 5^{th} start-up complex of BAS is being performed as well as the topping of cascade № 5 on the sludge pits №2 [2].

The majority of soil dams in Ukraine were built 20 years ago and nowadays they demand reconstruction (restoration of the project line and repairs of varying difficulty). About 40% of soil dams are in poor condition, and nearly 30% are in dangerous condition. In the process of their operation the dams are being deformed and their crest levels are being reduced. Slopes restoration and dam crest level filling up are often carried out with the soil of the same composition which was used for their construction. Softened soil from the slopes and the dam crest is removed, the loosening and subsequent contracting of its surface are performed as well as dumping, leveling, humidifying and compaction of the soil delivered from the quarry up to projected overflow section. When finding cracks or filtration holes, the trench exceeding the crack or hole depth is dug and filled up with the soil of the composition similar to that of the dam framework and is compacted by layers [3].

However, due to the low strength, water and frost durability of soils, the dam lines restoration must be performed on a regular basis, because the line's elements (slopes, crest) restored with the soil will not be able to effectively and extendedly resist the action of showers, seepage, abrasion, frost and other factors .

The scientists of our University suggest the application of embankment dams equipped with drainage-screen module (DSM) to reduce the seepage when protecting

the territories. [4], [5]. DSM is to be located on the side of the dam bottom slope. The module drain is placed on the side of the slope, while the screen is located behind the drain and reaches the soil surface. With this structure, when being reconstructed the embankment dam traps the surface and underground filtration water flows, and it results in the increase of the structure seepage resistance and prevention of suffusion processes from the dam downstream [6].

The technologies of defects liquidating by means of clay loam, clay, liquid solutions of clay and manure with the subsequent compaction are worth attention [7]. They are applied when filling up voids, filtration holes, cracks formed under the freezing of the dam top and subsiding of the lower soil layers which do not freeze.

There is also a technology of soil dams restoration by means of their dumping (topping) up to the necessary level not with soil but with soil mixture of optimal humidity (soil + screening dust + ash + cement), which is produced with the help of soil mixing installation [8]. When hardened, it becomes high strength (compressive strength is at least 10…15 MPa), water and frost resistant soil concrete which reliably protects the structure framework from the influence of aggressive factors. To prepare the soil mixture, the following components are necessary: Portland cement 400; soil – light slightly water permeable clay loam; screening dust – limestone crushing tailings with the fraction of 0…5 mm.

In conclusion, in terms of the existing and innovative technologies of restoration, there is a possibility to create modern, reliable and efficient protective soil dams to protect the territories from the harmful effects of water.

REFERENCES

1. (2015) http://dbuwr.com.ua/. [Электронный ресурс],http:// dbuwr.com.ua /docs/invpro.pdf, (дата обращения: 30.03.2015).

2. Реконструкция Бортнической станции аэрации// УНИАН, http:// ecology.unian.net/1166844-rekonstruktsiya-bortnicheskoy-stantsii-aeratsii-nachnetsya-ne-ranee-chem-cherez-god-klichko.html, http:// ecology.unian.net/, Oct. 2015.

3. Технология и организация ремонта мелиоративных гидротехнических сооружений / Ачкасов Г.П., Иванов Е.С. — М.Колос, 1984. — с. 174.

4. Клімов, С. В. Реконструкція гідромеліоративних систем зони надмірного зволоження з використанням дренажно–екранних модулів// Вісник НУВГП. Зб. наук. праць., 1(65), 2014.

5. Кожушко, Л. Ф., Ткачук, М. М., Ткачук, Р. М., Клімов, С. В., "Дренажно-екранний модуль," МПК (2006): E02B 11/00 5329, Mar. 15, 2005.

6. Ткачук, М. М., Востріков, В. П., Кириша, Р. О., Ткачук, Р. М., Жогло, В. В., "Дамба обвалування з дренажно-екранним модулем," МПК E02B 3/10 90887, June 10, 2014.

7. Васильева Е.В., Степанов П.М., ОвчаренкоИ.Х., Захаров П.С. Ремонт и восстановление грунтовых подпорных сооружений// Научный журнал. КубГАУ, №83(09), 2012.

8. Организация и производство гидротехнических работ / Иванов, Е. С. — М.Агропромиздат, 1985. — с. 400.

UDC: 551.521

V. Novitskiy, Master student
S. Skrypnichenko, PhD in Agr. Sc.
S. Sukhovetska, language advisor
Zhytomyr State Technological University

ENVIRONMENTAL ASSESSMENT OF SOIL CHANGES OF ZHYTOMYR REGION

The main objective of Agricultural and Environmental Sciences at the present stage of development of agricultural production is creating sustainable agro-ecosystem. In recent decades, a negative balance of humus and trace elements formed in Ukrainian Polissia due to a sharp reduction in application of organic and mineral fertilizers and crop rotation failure. There are also processes of decalcification and acidification of soils, which strengthen their mechanical and biological degradation. Soil agro-ecological condition significantly worsened because of contamination with radionuclides and heavy metals. Thus, soils become sometimes nonserviceable.

Also during the long-term reformation of the agricultural sector there was a gradual shift from collective to private-rental and private ownership of land. This period was marked by disregard for scientific technology, inefficient exploitation of such natural resource as soil fertility. Significant changes of Zhytomyr region soils occur under the influence of these factors.

Tilled farmlands in parts of the region have relatively high diversity in their indices. It has a very close relationship with the natural fertility of soil. Steppe is the most cultivated region (74 %); the transition zone occupies 47% of tilled lands; and Polissia - 29%. For example, 174.4 thousands hectares were limed for the period of 1986 – 1990; in 2001-2005 there were 5.2 thousands hectares limed; in 2006-2010 - 7.3 thousands hectares limed; in 2011 - 3.4 thousands hectares limed; and in 2012 - 3.7 thousands hectares limed.

It should be indicated that the lowest recorded humus content in soils of Korosten and Narodychi areas was 1.37% and 1.40%, respectively. It is 0.55% and 0.52% below the average absolute value of the regional index.

The gentle surface slopes of Zhytomyr region are characterized by the development of surface water erosion. This process is unnoticeable, especially in the early stages of its development. Microparticles and macroparticles that are formed by an active part of humus wash from the soil. As a result, soils lose a significant amount of waterproof units and therefore the formation of dust on the surface increases. Gradually, arable layer washes out and a lower horizon is exposed, and subsequently, soil color becomes lighter.

Speed of soil washing depends largely on how soil is used. Lack of proper organization of the territory, ignoring the technologies of soil cultivation can cause

washing of soil. On steep land slopes linear erosion of soil along with surface erosion leads to the formation of gullies and ravines, thus, the area of arable land decreases.

Very effective measure to combat the degradation processes in soil is optimization of land usage. Reduction of arable land makes it possible to concentrate the available material, technical and human resources on soils that can ensure their efficient use through obtaining better productivity of plantings. The ratio of accumulated organic matter (reaping and root remains) enters the soil and becomes material for the humus synthesis.

The main factor of soil fertility preservation is litter manure. Other types of manure have little influence on the formation of humus. All these activities are environmentally safe, which help restore growth of fertility and their rational use.

UDC 624.131.537+624.138.2

I. Okhrimenko, Master student
S. Kalchuk, PhD Engr., As. Prof., research advisor
S. Sukhovetska, research advisor
Zhytomyr State Technological University

TODAY'S MEASURES TO IMPROVE THE RIGIDITY OF SLOPES

One of the main problems of mining companies is to ensure safe mining operations at maximum technical-economic indicators. Maximization of steep slopes of quarries and dumps' sides is important when resolving the issue of these indicators increase. However, the question of mines safety is very important here, as far as the disturbance of the rock mass balance can result in landslides. First of all, it concernsthe alluvial deposits. The increased rigidity of mine workings is necessary to prevent. The necessary level of rigidity is achieved by applying landslide measures.

Currently, there are many ways to improve the rigidity of slopes: the application of geolattices, anchoring, and fastening via Gabion, various concrete and wooden structures.

Recently, the ways to increase sustainability using lattices and ground anchors are considerably spread abroad. But, a partial lack of recommendations, in particular on the geometrical parameters of strengthened zones, structural elements and their place in amassif, and these elements' impact on the increasing of slopes rigidity was discovered while studyingscientific publications, literature and the recommendations of the manufacturer.

It is possible to make some conclusions about the features of such devices as geolattices and ground anchors when studying official sources of such manufacturers as "LLC Evroyzol Heosyntetyks", "OJSC 494 UNR", "LL Heozahyst», «Foresight Products LLC».

Geo lattices that have a high chemical resistance are madeof environmentally friendly polyethylene and polypropylene material. Such lattice can take the load of at least 40 kN/rm. The durability of such construction is more than 50 years. The lattices are placed mainly on soft rocks, the rigidity of which is significantly affected by water saturation. Geolattices are used both for local, and for general sustainability (placement in layers). Consolidation is performed with v - shaped reinforcing rods. It enables to fill the non rigid steep slopes with special material. The lack of the rigidity of the collapseprisms is one of the disadvantages.

Self-opening ground anchors are used for tensile load. They are divided into three types: Duckbill (2,6-28 kN), Manta Ray (72-178 kN) and Stingray (445 kN). Installation of the first two types can be performed manually using a jackhammer. The installation of the anchor Stingray is performed by the excavator with a hydraulic hammer. Amongthe advantages of such anchors are: the accurate placement; the possibility of placement in less accessible spaces; the ability to test load capacity immediately after the installation. However, the problem is a small bearing surface (up to 2400 cm^2) which, in turn, is important when fixing slopes surface. First of all, it concerns soft rocks. Such rocks can "bypass" the anchor.

The technology of the injection anchor is initially carried out by drilling a given diameter.The draft anchor with reinforcing rods, including two injection tubes is established next. Then, a drilling hole is filled by a concrete mixture. A few days later, one more portion of a concrete mixture is filledthrough the second tube. It is necessary for pressing anchor bottom. When the anchor gets strengthened, its tension can be increased with a jack.

Consequently, assessing the advantages and disadvantages of these methods, some conclusions can be made. Geo lattice and soil anchors can be used incombination. Geo lattice copes well with the local soil fixation and soil anchors provide rigidness of slopes with deep slip surface. The absence of sufficient information on the combined use of these methods is the issue for discussion.

Since the calculation to determine the rigidity is labor-intensive, geotechnical software GEO5 was used to carry out the research.

Observations of the geometric parameters change to provide berm security were conducted when searching the optimum angle of slopes inclination. A board with a height of 15 m was taken for investigation. The calculations were carried out in different variants of the berm security placement. The board was divided into two terraces: I – bottom and II – top, with the security berm between them. There were 6 variants selected for calculations: 1) I – 3m and II – 12 m; 2) I – 6 m and II – 9 pm; 3) I – 9m and II – 6 m; 4) I – 12 and II – 3 m; 5) I – 7,5 m and II – 7,5 m; 6) I – 15 and II – 0 m. The results are shown in Table. 1.

Table. 1

Number var.	1	2	3	4	5	6
I-II, c.	3-12	6-9	9-6	12-3	7,5-7,5	15-0
α,degree	29.26	29.15	29.18	29.12	29	28.73

According to the study results, it was found out that security berms do not increase the rigidity of isotropic rock slopes. The reason is that forincreasing angles of terrace slopes by reducing the height it is necessary to increase the minimum security berm to a sufficient level.It is necessary to ensure the rigidity of the entire board.

A series of calculations to determine the optimal angle of inclination of the ground anchor and the optimal site for its location have been performed.

The angle of the anchor inclination, at which the coefficient of the board margin is the largest, was determined. There were two boardswith different characteristics selected for the experiment: I – the height of 10 m, and II – 15 m. A security berm was also placed on the board of 15 m height. In addition, the angle of the board inclination was different in both variants. The anchor position on the board I was changing with length increments of 2 m; and on the board II – in increments of 3 m. The angle changed from – 10˚ to 60˚ with increments of 10˚. The results are shown in Table. 2. Highlighted cells show the highest factor of rigidity margin.

Table. 2

Board №	h anchor, m	-10˚	0˚	10˚	20˚	30˚	40˚	50˚	60˚
I	2	1.47	1.48	1.49	1.49	1.49	1.48	1.45	1.43
	4	1.45	1.46	1.47	1.47	1.46	1.45	1.44	1.42
	6	1.44	1.45	1.45	1.44	1.44	1.42	1.41	1.39
	8	1.43	1.43	1.43	1.42	1.41	1.39	1.38	1.36
II	3	1.44	1.45	1.46	1.46	1.46	1.45	1.44	1.42
	6	1.43	1.44	1.44	1.44	1.44	1.43	1.42	1.4
	9	1.42	1.43	1.42	1.42	1.41	1.4	1.38	1.37
	12	1.41	1.41	1.41	1.4	1.39	1.38	1.37	1.31

According to specified ratios, there are several options of the angle inclination. The minimum distance of the anchor descentto a sliding triangle was determined. Thus, the most optimal inclination angles were found. These figures are marked by a dark color Table. 2. It was found out that the change of anchor inclination by 10˚ reduces its length by approximately 15-30% in the area from the slope surface to the sliding triangle.

Some conclusions can be drawn according the research results. Anchors should be placed in the lower section of slopes at an angle of 30˚; in the top section at the angle of 10˚; and in the central section at an angle of 20- 30˚. It can be proved by the highest factor of rigidity margin, and the shortest distance to asliding triangle.

Thus, an optimal position and the angle of ground anchors were found out in the process of similarmine workingsstudy. The position of security berms was also studied. According to the obtained data, it was proved that security berm does not affect the rigidity of the board in a homogeneous massif. It is caused by the need to ensure rigidity by increasing the width of security berm from minimum to optimum indices.

UDC 622.235.5

I. Pavliuk, PhD student
S. Iskov, PhD prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

THE ANALYSIS OF THE ACCURACY DETERMINATION OF OVERSIZE OUTPUT

The estimation of the accuracy determination of the oversize output by three known methods such as the method of direct measuring, the weighing method and the method of photogrammetric survey was carried out. The most accurate method for rational use in assessing the accuracy of the oversize output in a quarry was chosen.

Drilling-and-blasting is the main process of preparing rock to excavation. The criterion for assessing the quality of drilling and blasting is the intensity of the rock grinding. The heterogeneity of sizes of rock pieces is a serious drawback inherent in blasting. The percentage of oversize yield is of particular interest for enterprises because the performance and life expectancy of loading and transportation equipment and reliability of its work depend on the output of the oversized fraction. Thus, the justification of the most rational methods for determination of oversize yield is relevant and necessary to the quarry extracting block and rubble products.

A large amount of technical literature is devoted to the question of the influence of conditions and parameters of blasting on the intensity of grinding. Analyzing it, one can draw certain conclusions that with increasing strength and blocking of rocks, the middle piece of crushed rock and oversize yield increase, and also increase of the intensity of crushing of the rock mass is achieved by increasing the specific consumption of explosives (E).

That is why improvement of the efficiency of blasting operations, search for new ways of their perfection are urgent and important tasks of mining enterprises, as the competitiveness of products is the main technical task, which each mining enterprise should solve individually.

One of the ways to determine the amount of oversize is to use *the method of direct measuring*. This method is a unit record (measurement) of pieces of oversize, that are subject to repeated blasting. The output of the oversize is defined as the ratio of the total length of large oversized pieces $\Sigma l_н$ to the total length of the lines ΣL (1.1):

$$V_н=\Sigma(l_н / L) \qquad (1.1)$$

To determine the amount of the oversize, it is necessary to multiply the obtained percentage of oversize yield by the total volume of the exploded block. Such work is rather time-consuming for the surveyor. This requires a significant amount of time on each unit measurement of oversize and a large amount of calculations of their volumes. The error of detection capacity of this method can vary in the range of

15..30% and therefore it is possible to draw a conclusion about the low efficiency of this method and the low use of it at the production due to high labor intensity and inaccuracy of measurements.

One of the most accurate methods of determining the volume of output of oversize is *a method of weighing*. After a mass explosion the entire flow of vehicles with standard size pieces of rock from a specific research area can be directed through the scales.

Thus we can determine the total mass of granite that has been crushed to the required size in the explosion. The output of the oversize can be estimated by the formula (1.2):

$$\gamma_н = \frac{m_н}{m_н + m_{г.м.}} \cdot 100\% \qquad (1.2)$$

where $m_н$ - the weight of oversize, t;

$m_{г.м.}$- the weight of the standard rock mass.

When determining the volume of excavated rock and overburden production on the weighing results, the error margin of the mass of rocks is taken not more than 3%. Method for the determination of oversize by weighing does not require any serious measurements and calculations by the surveyor. For such accounting neither expensive instruments nor complicated software is needed. Nevertheless, a reliable accounting of the number of shipped vehicles should be provided. This allows to increase the productivity of the surveyor and simplify the calculations to the minimum. Given the accuracy of determining the oversize by this method (3%) we can conclude about its high economic efficiency and expediency of application.

Nowadays, one can see rapid development of digital and computer technologies, microelectronics and optics. It could not avoid the mining industry either. Scientific-production enterprise "Krivbassakademinvest" has introduced a new software product "Geoinformation system K-MINE". It has a special module of determining the granulometric composition of the exploded rock mass, which is called K-Granules.

Photographic images are prepared in a quarry in the working face, where it is necessary to conduct the testing. Work is performed with a digital camera and a scale bar. For this purpose two scale bars are placed at an arbitrary distance from each other (Fig. 1.3). Thus on a flat picture by using special methods, spatial coefficients of recalculation of rock pieces projections at true size can be calculated.

This method of determining the percentage of oversize yield using K-MINE is very efficient and simple. The surveyor does not need to perform any measurements on the collapse of the rock mass, only to photograph it. The software is fully automated and requires no in-depth computer knowledge. After practical studies and comparing this method with the weighing method, we can estimate the accuracy of the determination of oversize as very high (the error is not more than 5..7%).

Conclusion. After analyzing the methods for assessing the accuracy of oversize yield, it was determined that the most accurate method of determining the volume of oversize yield by the results is a weighing technique that does not require any serious measurements and calculations by the surveyor. For such accounting neither expensive instruments nor complicated software are needed. Only a reliable accounting of the number of shipped vehicles should be provided. This allows to increase the productivity of the surveyor and simplify the calculations to the minimum. However, taking into account today's rapid development of digital and computer technologies, microelectronics and optics, a few years ago scientific-production enterprise "Krivbassakademinvest" has introduced a new software product "Geoinformation system K-MINE" which can be used to determine granulometric composition of the exploded rock mass. Determination of the percentage of oversize yield using K-MINE is very efficient and simple. After practical studies and comparing this method with weighing, the accuracy of the determination of oversize can be estimated as very high (the error is not more than 5..7%), which suggests that this method is very effective to use nowadays in comparison with the weighing method.

REFERENCES

1. Суханов А. Ф. Разрушение горных пород взрывом / А. Ф. Суханов, Б.Н. Кутузов.М.: Недра, 1967. – 340 с.

2. Суханов А. Ф. Предпосылки теории дробления пород взрывом. Вопросы теории разрушения горных пород действием взрыва / А. Ф. Суханов. – М.: Изд-во АНСССР, 1958. – С. 216-219.

3. Эткин М.Б., Азаркович А.Е. Взрывные работы в энергетическом и промышленном строительстве: Научно-практическое руководство. – М.: Издательство Московского государственного горного университета, 2004. – 317с.

4. Нормативный справочник по буровзрывным работам / Ф.А. Авдеев, В.Л. Барон, Н.В. Гуров и др. – М.: Недра, 1986.

UDC 621.74

K. Ruda, Junior specialist student
R. Yermolenko, teacher of foundry production of ferrous and non-ferrous metals and alloys, research advisor
N. Barbelko, PhD in Pedagogy, language advisor
Berdychiv College of Industry, Economics and Law

RAPID PROTOTYPING AS PROGRESSIVE METHOD OF MASTER-MODELS FORMING

Modern technology is impossible without the foundry production. The foundry shop is among the main shops of any engineering or metallurgical plant. Technical progress in foundry industry allows casting parts with minimal weight and significantly reducing allowance for machining, and in some cases getting ready parts, which are used for assembly.

The traditional technology for producing castings is carried out under the scheme: development of design documentation, production of the master model, making the sand mold and pouring molten metal into molds. The most time-consuming part of the process is the production of master models in accordance with the requirements of the future casting.

Models are classified according to the material, accuracy and structural characteristics. According to the nature of the material models are divided into wood, metal, non-metallic (plastic, plaster, polystyrene, wax, etc.). Accuracy of models depends on the required dimensional accuracy of castings [4].

Master models are made in different ways: on some enterprises milled parts are made of plastic, soft metal or wood on CNC machines, on the other – are hand-made by master modeler. But all these methods require the involvement of production capacity, the use of highly skilled manual labor and they are usually time-consuming. Today it is possible to produce master models of new products quickly, efficiently and inexpensively [3].

Rapid Prototyping (RP) is progressive quick method of forming models of a part or finished product, using computer-aided design (CAD) software.

The scheme of this process includes:

– 3D design or prototyping parts in any CAD-system;

– computer optimization of foundry technological process parameters, calculations, allowances for machining, casting solidification, etc.;

– separating layers of 3D model on a set of 2D models;

– development of programs for laser and materialization of model.

The advantages of RP technology are speed, accuracy, and cost reduction in the manufacture, research and individual sketches, no special equipment, the minimum amount of manual work [4].

Models are made by the RP, can be made of different materials (depending on the applied technology equipment). Different modeling materials are used in 3D printers, such as: plastic ABS, ABS Plus, ABS-M30 and ABS-M30i, polycarbonate, plastic – a mixture of PC and ABS, polyphenyl PPSF (PPSU). The advantage of these materials is that they all are used in the production of finished products, and thus differ by their manufacturing accuracy, durability and thermal stability, they don't deform, shrink and absorb moisture. Constructing process are significantly automated and allow to obtain high-quality and relatively inexpensive models, spending for their manufacturing hours, but not days and weeks, as when traditional methods are used.

Another forming method is based on a cutting a path of cross-section of model on paper or plastic by laser beam. Then, the bonding layers of two-dimensional contours and making of three-dimensional model is done. The disadvantage of this system is that grinding, polishing, protection from moisture of model surface is necessary. Accuracy of surface model configuration is determined by the thickness of paper.

Different versions of RP technologies allow making models from powder materials by using the laser beam energy; applying molten material with the help of many inkjet heads (like inkjet printers); filamentous polymer layer deposition; stratified "gluing" particles of powder materials using a connecting composition that is fed through jet head.

Application of some alloy powders as a material during selective laser sintering allows receiving finished products immediately with high purity of surface and the proper physical and mechanical properties. However, the technology of producing alloys of dispersed powders is expensive and time consuming process. So in each situation it is necessary to do technical and economic evaluation of the method of obtaining the foundry model.

The most economical method of producing master models in the foundry industry is the technology of Fused Deposition Modeling (FDM). FDM is a laying the molten material. The principle of creating FDM technology prototype models is layered building of molten polymer thread to semiliquid state in accordance with the mathematical model detail geometry developed in the CAD system. Mathematical model in STL format is transferred in a special software Insight, which automatically orients its to the installation work area and breaks down into horizontal layers. Then, in Insight (also automatically) the need of using a supporting element for the overhanging parts of the model is determined. The generated data are transmitted to the facility and the process of creating layered model is begun [1, p. 198].

A variety of computer graphic editors are used to create a computer 3D prototypes of the master models. They allow doing the volumetric 3D modeling and storing the image in the STL format. Integrated, design and technological systems are used in most enterprises and allow modeling and solving technological problems up to the program for the realization on CNC machines. Computer engineering graphic systems have the ability to produce the design on a "computer engineering" as an initial source of information for further development either already established or created by the developer of the volume model of the product [2, p. 186].

Technology of master models and castings includes the development of a 3D model to give the mathematical model parameters in the absolute coordinate system, which eliminates the error of dimension chains at the design stage. After that the technical documentation in accordance with the rules of system design documentation and unified system of technological documentation which includes 2d drawings is desined. Application of rapid prototyping technology is the next step. ABS-plastic master model are created on 3D printer.

The next step is the application of the semiforms filled with molding sand, for sand casting. The box with the mold halves is assembled and the process of filling the sand mold with molten metal is begun. The sand blasting machine is used after removing the casting from the mold halves for cleaning parts from moldable mixture and then the sprue is removed. The technical control of geometrical parameters of the finished part is done at the final stage [1, p. 198].

The advantages of ABS models are increased accuracy, simplification of preparatory and auxiliary operations, reduction of production time and tool costs.

So application of ABS models provides a number of advantages in compare with traditional casting technology on wax models:

– significantly reduces the time for preparation of foundary production, as there is no need of designing and manufacturing equipment for the production of wax models;

– strength and thermal stability of ABS simplifies the requirements for the models transportation;

– it is possible to create thin-walled parts;

– the scope of the final product due to the possibility of more accurate models of manufacturing expands;

– greater efficiency at small-scale production is achieved.

REFERENCES

1. Ильюшенко Н.В. Объемное моделирование и прототипирование в литейном производстве / Ильюшенко Н.В., Уланович А.В., Селезнев В.А. // Современные наукоемкие технологии. – 2013. – № 8-2. – С.198-200.

2. Медведев А.А., Селезнев В.А. Применение информационных образовательных технологий на основе компьютерного 3D моделирования. В кн.: Модернизация профессионального образования в России и мире: новое качество роста // Материалы международной молодежной конференции. – Мурманск, МГГУ, 2012. – С. 186-189.

3. Селезнёв В. Инновационные технологии для формирования компетенций рабочих. Исследования и практические рекомендации / Селезнёв Владимир. – Lambert Academic Publishing, Germany, 2011. – 118 с.

4. Хричиков В.Є., Меняйло О.В. Ливарне виробництво чорних і кольорових металів: Навч. посібник. Видання друге, доопрацьоване / В.Є. Хричиков, О.В. Меняйло. – Дніпропетровськ : НМетАУ, 2015. – 89 с.

UDC 622.271.6

A. *Sakhnenko, Master student*
O. Tolkach, PhD in Engr., As. Prof., research advisor
S. Sukhovetska, language advisor
Zhytomyr State Technological University

RESEARCH OF THE FEATURES OF HYDRO TRANSPORTATION OF ROCKS AT LOOSE FIELDS

The raw materials source of rare metals of Ukraine is presented by complex scatterings of the minerals connected generally with residual crust of aeration of the Ukrainian shield.The delluvial-alluvial and partially alluvial scatterings of theIrsha (Zhytomyr region) basin, as well as the coastal Samotkansk (Malishevka) scattering in Middle Dnieper Area are developed.

Today the costs for mining, considering the prime cost of the end products, fluctuate from 40 to 50%. Efficiency of mining works is defined by such processes of hydromechanization as pressurized hydrotransportand pulpifaction.Expenses for such works can reach 40%, and 55 - 60% ofwhich are spent for transport. The share forhydrotransport makes 95% and 86% of the general costs for transportation.

Thus, costs for mining depend on overall performance of a hydrotransport complex.

The analysis of operational conditions and operating modes of hydrotransport complexes at Ukrainian quarries allows allocating the major factors defining efficiency of technologies of hydromechanization at opencastmining of titanic fields: complex impact on a hydraulic bias and a critical speed of polydispersityof a transported material; the content of minerals with different density and the settled pulsations of pressure; the consumption of hydromixture. In modern conditions the choice of rational parameters of the hydromechanizationprocesses is possible only when taking into account all these factors.

Economic researches demonstrate that hydraulic transport of solid bulk material, especially coal, should be considered as a kind of pipeline transport. Economic efficiency of this kind of transport is objectively caused by features inherent in this transport technology: the transportation of a continuum instead of the separate transport units; a combination of the way and"rolling stock" in one engineering construction; a stationary arrangement of engines; and underground layingof the pipeline. The listed above factors define technical efficiency of hydrotransport which due to scientific justification turns into economic and social efficiency that is shown in various forms of realization of the main advantages of hydrotransport:

- big capacity; transportation process continuity;
- elimination of the intermediate operations demanding creations of special devices and the maintenance of personnel (delivery from railway stations,

unloadingat a warehouse and transportation from a warehouse, preparation of freight for use, quality control etc.);

• elimination of materialslosses when transporting, loading and unloading;the losses canreach 2% and more at railway transportation;

• elimination of noise, dust content and harmful emissions in environment, and also impact of the environment on the transported materials;

• sharp reduction of the number of industrial personnel in comparison with the railroad;

• increase of transport safety due to the avoidance of coming across of transport and human streams at one level;

• insignificant terms of construction and a possibility of pipelines laying in the shortest way, considering the topographical conditions and a relief;

• considerable economy of land area, because of smaller dimensions of pipeline systems, as well as smaller right-of-way; a possibility of soil recultivation;

• independencefrom seasonal and weather conditions;

• full automation of all production operations of a transport process.

At the same time, a hydrtransport system can also have some shortcomings: the need to preparehydromixture of a certain concentration and granulometric composition; the need of dehydration of coal before transportation to a consumer (except a case of the high-concentrated water coal suspensions), purification of technological water and (in some cases) a construction of the return conduit; a highly specialized orientation of transportation –one way transportation of those freights which don't lose commodity value during a long contact with water.

The above-mentioned facts donot completely cover all opportunities and features of hydraulic pipeline transport of solid bulk material, but the data showthatthis type of transport is one of the main transport technologies.

UDC 69.032.22

V. Sokol, student
A. Shostachuk, PhD in Engr., As. Prof., research advisor
D. Shostachuk, PhD in Engr., As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

DESTRUCTION PROCESSES IN THE COLLISSION OF AIRCRAFT WITH A HIGH-RISE BUILDING

Despite temporary difficulties in Ukraine of mostly economic nature associated primarily with the annexation of the Crimea and the military confrontation in the East, we can expect that in the coming months hostilities will cease completely. Later, after the renewal of the Ukrainian law on the entire territory of Ukraine, as was

the case until 2014, we will observe strong economic growth, the objective conditions for which have already appeared. In the first place, renovation of volume of civil engineering, including high-rise buildings, is expected. One of the hazards associated with the operation of tall buildings is the possibility of their partial or complete destruction in the collision with the aircraft [1, p. 92-93]. This risk has become even more acute in recent years, with an increased activities of radical Islamist movements, one of the directions of which is terrorist acts. The purpose of these actions is, as a rule, the destruction of buildings, so that there may be significant casualties. High-rise buildings are quite convenient targets for terrorist attacks, and it is becoming increasingly difficult to predict and prevent them.

Let's consider the factors that will determine the stability of high-rise buildings at the destruction of supporting structures. Evidently, these factors can be divided into 2 groups [2, p. 18, 19]. The first group is the characteristics of high-rise buildings: the number of floors, the spatial structure, the stability of walls and ceilings against the spread of fire, etc. The factors of the first group prevent the occurrence of significant damage in a high-rise building to some extent, and provide protection of high-rise buildings from the complete destruction.

The second group is the characteristics of the zone of destruction (explosion): height (floor) on which the destruction happened, the location of fracture zones within the floor (in the room or outside) and the power of destruction. Apparently, the destruction from possible terrorist attack can be reduced at the design stage. The problem lies in the use of such spatial structure and materials, which in the conditions of partial destruction of supporting structures can provide, within a predefined time, resistance against high-rise buildings destruction that progresses.

The complexity of this problem is not only the large variety of possible spatial structures of high-rise buildings, but also the inability to predict the characteristics of the aircraft (mass, speed, presence of explosives) and the floor where collision can occur. At the same time, the analysis of certain events that occur in the collision of the aircraft with high-rise buildings seems possible. As high-rise buildings and aircraft are rigid bodies, we consider the moment of their collision within the theory of impact when the plane has against the high-rise building some momentum $m_l v_{l,}$ where m_l and v_l are the mass of the aircraft and its speed at the time of the collision, respectively.

This allows us to determine the dynamic impact of the aircraft on the supporting structures. After this the partial destruction of a high-rise building and an aircraft begins to the point when the kinetic energy of the aircraft reduces to zero. It is necessary to consider the effect of forces on the supporting structures and floors, using numerical methods. The force will be equal, according to Newton's second law, to the product of the mass of the aircraft by its acceleration. This acceleration will be determined by the initial speed of the aircraft and the time when its speed dropped to zero. The use of reduced physical models of high-rise buildings seems appropriate to determine their stability against destruction that progresses, i.e. the scales and speed of further damage. It is possible to accurately reproduce the spatial structure of high-rise buildings and provide any options of supporting structures destruction using such

models, measuring both supporting structures and horizontal beams by the sensors of deformation.

Certain material costs and manufacturing time of this model and difficulty of experimental determining of the impact of high temperature on the stability of structures are disadvantages of this method of research, as it is difficult to create temperatures of hundreds, perhaps thousands of degrees in a small volume. But we can obtain valuable results, taking into account the scale factor without considering the change in the temperature regime in the event of damage.

We believe solid-state computer simulation to be promising, since it is possible to reconstruct the spacious structure of a high-rise building, to load supporting structures by forces, and to investigate the stress state of selected elements of a high-rise building. High temperatures may partly be replaced by introducing additional internal stresses in the material. These stresses caused by high temperature in the actual construction should be calculated in advance.

Obviously, computer modeling is less expensive both financially and in time and allows to explore any options of the constructions of high-rise buildings and loads on the supporting structures. Variables are as follows: the height of buildings and each floor, size, material of manufacture, quantity and relative position of supporting structures, the load on the horizontal overlap, external load (wind on the side walls or seismic on foundation). Therefore, the best decision is to use both of the above methods to address each specific task.

REFERENCES

1. Шостачук А.М. Виникнення екологічних небезпек при зведенні висотних споруд в умовах міської забудови. Тези VI Міжнародної науково-практичної конференції «Практична космонавтика і високі технології», присвяченої 100-річчю з дня народження академіка С.П. Корольова, м. Житомир, 9-11 січня, 2007 р. С. 92-93.

2. Мельничук М.М., Шостачук А.М., Шостачук Д.М. Управління висотною будівлею як складним об’єктом. Моделі реакції системи. – Вісник ЖДТУ, № 4 (67) / Технічні науки. – 2013. – С. 17-21.

UDC:332.3

A. Soroka, Student
V. Krasnov, Dr. of Ecol., Prof., research advisor
S. Kuriata, language advisor
Technologische Universität Zhytomyr

DER ÖKOLOGISCHE ZUSTAND DER LANDWIRTSCHAFTLICHEN PRODUKTION IN GP «JEMELTSCHIN LH»

Der Wald ist ein wesentlicher Teil der natürlichen Umwelt. Er wirkt sich positiv auf das Klima, die Reinigung der Atmosphäre. Äußerst wichtig ist Erholungs

rolle, kulturell-ästhetische Rolle der Wälder. Sehr weit werden mit diesem Ziel ein Erholungs- und Heilungswälder mit der Fläche von 46,5 Hektar benutzt.

Der Zustand und die Dynamik der Forstwirtschaft ermöglichen, den ökologischen Zustand der Wälder pro Jahr der Waldbewirtschaftung zu beurteilen. Alle Geschäftsaktivitäten wurden in Übereinstimmung mit den geltenden Vorschriften durchgeführt. Sie wurden auf die Verbesserung der Qualität und Produktivität der Wälder und ihre Schutzeigenschaften gerichtet. Negative Auswirkungen werden auf die Umwelt, die mit der Landwirtschaftstätigkeit und der Industrie und anderen Faktoren verbunden sind, nicht verursacht.

Der größte Schaden den Wäldern machen eine wachsende Schwächung der Bäume und Biberpopulationen, als Resultat werden sich die Wälder in den Mooren geändert. Wegen der Unstabilität der finanziellen Situation in der Ukraine wurden die Maßnahmen zu Vergrößern der Produktivität von Waldpflanzen und jungen natürlichen Unterholz nicht erfüllt.

In der Forstwirtschaft gibt es nur vorübergehend Pflanzenstätte etwa 5,3 Hektar. Die produktiven Flächen sind über 2,7 Hektar, und die Zahl der jährlichen Sämlinge sind in den letzten zwei Jahren stark gewachsen - im Durchschnitt auf 2,5 Millionen Stücke.

Um den Bedarf an Forsterneuerung zu erfüllen, brauchte man ungefähr 4440 kg Saatgute im Jahr. Die tatsächliche Ernte von Saatguten betrug in den letzten Jahren 27 341 kg, das heißt durchschnittlich 13.671 kg wegen der hohen Zahl der Ausbeute. Um ein hohes qualitatives Pflanzmaterial mit wertvollen Eigenschaften zu bekommen,wurde eine permanente Basis geschaffen. Man muss sagen, dass die Zahl der vorhabenden Pflanzenstätten für das neue Anlegen genug sind.

Also, man kann zusammenstellen, dass

1. Der Zustand und die Dynamik der Forstwirtschaft ermöglichen, den ökologischen Zustand der Wälder pro Jahr der Waldbewirtschaftung zu beurteilen.
2. Alle Geschäftsaktivitäten wurden in Übereinstimmung mit den geltenden Vorschriften durchgeführt. Sie wurden auf die Verbesserung der Qualität und Produktivität der Wälder und ihre Schutzeigenschaften gerichtet.

UDC 679

R. Tsymbaliuk , Master student
R. Sobolevsky , PhD Engr., As. Prof., research advisor
S. Sukhovetska, language advisor
Zhytomyr State Technological University

STUDY OF FRACTURING OF BLOCK GABBRO KURHANTSI DEPOSITS

The study of fracturing is a topical scientific and applied issue for enterprises which produce block products. Detailed study of spatial orientation of fractures will determine an expected output of blocks in mineral deposits or in some areas; which, in turn, will reduce economic costs and enable planing technical measures to improve the quality of the final product. The system of an enterprise activity is connected with the system of fractures and it puts the vector of a deposit developing and demining.

The depths of the fractures localization were broken at intervals by the Stedzherss formula to assess the impact of fractures localization on the angle of fractures depth:

$$h = \frac{X_{max} - X_{min}}{1 + 3.2 \log n} = 3{,}54 \text{ м}; \quad (1)$$

where X_{max} – maximum distance between fractures ($X_{max} = 34{,}66$ м);
X_{min} – minimum distance between fractures ($X_{min} = 2{,}8$ м);
n – a number of units of the totality (n = 265).

The method of Kriging is used to build vector models and models of contours of a fracture incidence angle. The mathematical description of the method is as follows:

$$Z_V^* = E_{i=0}^{N} \lambda_i Z(x_i); \quad (2)$$

λ_i -the weight at which the estimate is unbiased;

$Z\ (x_i)$ – the value of output samples;

N – the number of samples.

Implementation of the proposed methods of fracturing study allows getting reduced models of the angle changes of fractures incidence for nine intervals:

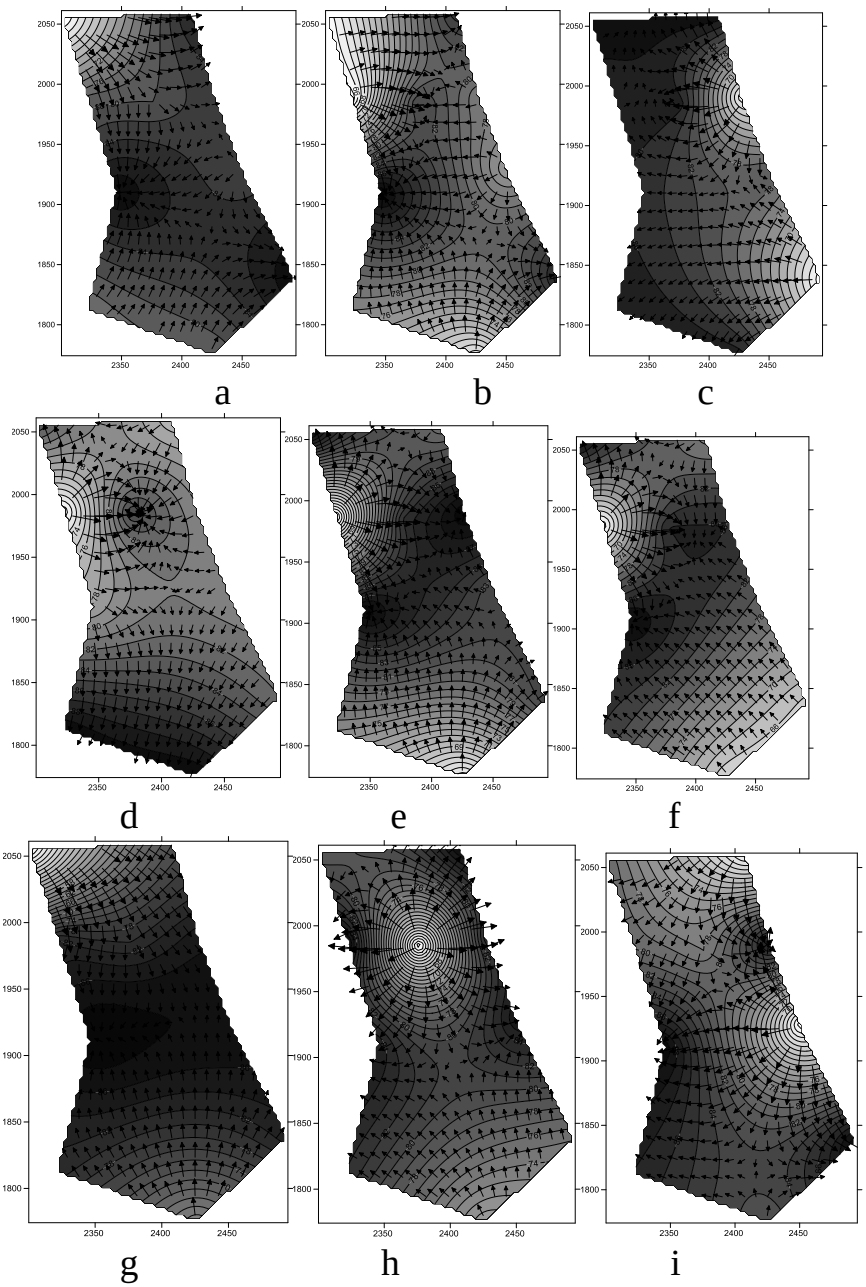


Fig. 1. Reduced models of the angle changes of fractures incidence for nine intervals 2,8 – 34,66 m.

a(2,8-6,34 m), b(6,34-9,88 m), c(9,88-13,42 m), d(13,42-16,96 m), e(16,69-20,5 m), f(20,5-24,04 m), g(24,04-27,58 m), h(27,58-31,12 m), i(31,12-34,66 m)

In the study of patterns of changing angles of incidence for 2,8-6,34m and 6,34-9,88m intervals (Fig. 1 a, b), a common tendency in the angle of incidence of fractures in the western and south-eastern part of the deposit, with a gradual decrease in the angle of the north and south direction, can be observed.

The interval 9,88-13,42m (Fig. 1 c) shows the increase of the angle of fractures incidence from two eastern pole points in the northern and southern west direction respectively, if compare to 2,8-6,34m and 6,34-9,88m intervals.

The interval 13,42-16,96m (Fig. 1 d) is characterized by a partial increase in the angle of incidence which is concentrated in the central part of the deposit; its maximum values are concentrated in the south part of the deposit.

The intervals 16,69-20,5m, 20,5-24,04m, 24,04-27,58m (Fig. 1 e, f, g) are also characterized by the increase of the angle of fractures incidence from the north and south to the middle. Thus, these intervals demonstrate the opposite tendency compared to the intervals 9,88-13,42m and 13,42-16,96 m.

The incidence angles at the interval 27,58-31,12m (Fig. 1 h) increase from the peak north-central part in all directions, as well as from the southern part in the northern direction.

The interval 31,12-34,66m (Fig. 1 i) has an ambiguous character. There is a decrease in the incidence angle from the central-eastern, south-eastern and western parts in all other directions.

Having built the model of the change of fractures incidence angle for the entire field and for all intervals of angles of fractures occurrence (Fig. 2), it can be proved that the most effecient blocks output due to the vertical angles of occurrence is observed in the central western part of the deposit; the least efficient blocks output is observed in the north-western and southern parts of the deposit. The mining process can be carried out at the heights of quarry face which correspond to the intervals of fractures grouping according to the incidence angles.

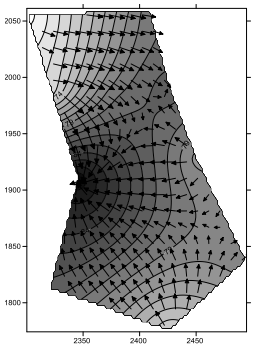


Fig. 2. The model of the change of fracture incidence angle for the whole deposit

Conclusion: the results of the study of spatial orientation of fractures show that gabbro surface is fractured and affected by weathering processes. The entire area of a rock massif has the incidence angles approximately 80˚or less. The incidence angles in the central-western part reach 9˚ and they have a favorable shape in terms of technical and economic parameters.

REFERENCES

1. Catalogue of Online calculators «PLANETCALC» [Electronic resource]// Access mode: http://planetcalc.ru/481/ (15.03.16). — Title screen.

2. The report on the exploration of Kurhantsi block gabbro deposits, H. I. Datsyuk. — K. : 2007. - 44 p.

3. Beskrovnyi V.S. The method of constructing three-dimensional variogram dependency on geological data sets [Electronic resource]: [http:// www.rusnauka.com/14_NPRT_2010 / Informatica/66771.doc.htm] / Beskrovnyi V.S., Harkusha I.N.; National Mining University - Access mode:http://www.rusnauka.com/14_NPRT_2010/Informatica/66771.doc.htm (18.03.16). — Title screen.

UDC 543.6

V. Vinskyi, the 3-rd year student,
G. Skyba, PhD in technical sciences, As. Prof., research advisor,
S. Sukhovetska, language advisor
Zhytomyr State Technological University

THE USE OF QUALITATIVE AND QUANTITATIVE METHODS IN ANALYTICAL CHEMISTRY TO DETERMINE THE CONTENT OF NITRATES IN COOKED MEATS

Nitrates are present almost in every food product but their amount should not exceed the limiting concentrations. Complex toxicological and hygienic studies have established acceptable daily dose intake of NO^3: 320 mg or 4 - 5 mg per 1 kg of body weight.

An excess of levels in the human body can adversely affect health. In digestive tract the nitrates transform partially into more toxic nitrites causing toxic effect. The nitrites in blood can cause methemoglobinemia, as well as hypoxia (tissue oxygen starvation) which develops due to the disturbed transportation of oxygen in blood. Products boiling and broth draining can reduce nitrate levels. Soaking of products slightly affects the nitrate content. It is useful to eat products rich with vitamin C, as far as it reduces the nitrate content in food.

There are several methods of quantitative analysis to determine the nitrate content:

- Photometric methods are based on the conversion of nitrate to nitrite, followed by the formation of colored solutions. The intensity of the red color of solutions containing nitrites is measured with photoelectric-color measurement device at a wavelength of 538 nm;
- Chromatographic methods (the method of gas chromatography, gas-liquid and ion chromatography). The method is based on different sorption of anions by adsorbent;
- Electrochemical methods: voltammetric methods are based on the detection of current-voltage curves (voltammogram); potentiometric methods provides application of ion selective electrodes (based on determining the relationship between

the balanced electrode potential and thermodynamic activity of ions involved in electrochemical reactions);

- Special devices, such as nitrate-tester SOEKS NUC-019-1 is used for assessment (rapid test) of quantitative nitrate content in products.

For qualitative and quantitative determination of nitrate content in cooked meats, it is necessary to draw extract from samples for their further analysis. A preliminary study is conducted for this purpose. After the shell is removed, samples are crushed twice in a meat grinder with lattice holes (diameter of 3 to 4 mm). Samples are extracted with water and received solutions are with precipitated proteins. The next step is the filtration of our solutions. The analysis of the filtrate should be conducted not later than 24 h after sampling. Samples of raw products are immediately analyzed after grinding. The qualitative determination of nitrate is conducted using fractional technique with the help of following qualitative reactions.

1. The reaction with copper and sulfuric acid. A concentrated sulfuric acid and a copper metallic piece are added to a nitrate solution. The content of the test tube is heated. The emission of brown gas (NO_2) indicates the presence of nitrate in the reaction.

$$2NO_3^- + 8H^+ + 3Cu = 3Cu^{++} + 4H_2O + 2NO$$

$$2NO + O_2\ (air) = 2NO_2\uparrow$$

2. The reaction with iron (II) sulfate. A small amount of a nitrate test solution is continuously stirred and added to a solution of $FeSO_4$. Then, the concentrated H_2SO_4 is gently added into the tube, flowing down the walls so that the liquid could not mix at once. A brown ring appears on the verge of layers of H_2SO_4 and $FeSO_4$ solution. The reaction of NO with $FeSO_4$ gives weak complex relationship forming a brown compound [Fe (NO)] SO_4.

$$2NaNO_3 + H_2SO_4 = Na_2SO_4 + 2HNO_3$$

$$6FeSO_4 + 3H_2SO_4 + 2HNO_3 = 3Fe_2(SO_4)_3 + 4H_2O + 2NO$$

3. Nitrate reduction to ammonia when interacting with metallic zinc in the presence of alkali. A concentrated solution of alkali and a small amount of zinc dust are added to test tube with solution. The tube is closed (not too tightly) with a cotton wad (a thickness of about 1 cm) to avoid alkali splashing. A wet piece of phenolphthalein indicator or litmus paper is placed above the wad. In these conditions NO_3 ion is reduced to NH_3 which, in its turn, causes redness of phenolphthalein indicator or changes the color of litmus paper into blue.

The reaction is given in the equation:

$$NaNO_3 + 4Zn + 7NaOH = NH_3\uparrow + 4Na_2ZnO_2 + 2H_2O$$

4. The reaction with manganese (II) chloride ($MnCl_2$). Heated nitrate test solution with dual volume of saturated $MnCl_2$solution in concentrated HCl becomes dark brown, due to the formation of complex ions $[MnCl_6]^{2-}$:

$$3MnCl_2 + 12HCl + 2HNO_3 = 3H_2[MnCl_6] + 3H_2O + 2NO\uparrow$$

5. Reduction of NO_3- to NO_2-. The action of metallic zinc in the presence of acetic acid:

$$NO_3^- + Zn + 2CH_3COOH = NO_2^- + Zn^{2+} + 2CH_3COO^- + H_2O$$

6. MICROCRYSTALOSCOPIC reaction. The drop of the nitrate test solution is added with a drop of 10% solution of organic base "Nitron" ($C_{20}H_{16}N_4$) in 5% acetic acid. Sediment of a special cluster of needles of sour-nitrogen "Nitron" $C_{20}H_{16}N_4 \cdot HNO_3$ is formed.

7. The reaction of diphenylamine. 5 - 6 drops of diphenylamine in concentrated H_2SO_4 are placed on thoroughly washed and dried laboratory glass. Nitrate test solution is added with the a clean glass rod and stirred with the diphenylamine compound. Due to the oxidation of diphenylamine by nitric acid and in the presence of NO_{3-} an intensive blue color appears.

Recently, for the qualitative determination of nitrate content in foodstuffs the indicator paper "Indam" is used. It displays different colors depending on the content of nitrates in samples. Its colors are similar to those which are formed in the reaction of diphenylamine. By the attached indicator scale we can set approximate quantity of nitrate in samples. Thus, the indicator paper "Indam" can be used in practice for rapid assessment of nitrate content in samples. For examination of the nitrates concentration in samples of sausage products reaction with diphenylamine was used. Sensitivity of the reaction is 0,001 mg per 1 ml. Nitrate content was determined comparing the color of the test solution extracts with a standard scale. The results are presented in the table. There were selected 4 different sausages of Ukrainian producers for our assessment: "Salami" - the manufacturer of LLC "Barcom" ("Rodynni kovbasky"), "Likarska" - TD "Myasna gilidiia", "Likarska" - factory of "Singurivski kovbasy" and "Zolote telia "- TD "Myasna gildiia".

Table

The results of the assessment of nitrates content in sausage products

Results of the laboratory research				Standard scale	
Trade mark	Kind of sausage	Solution color	Nitrates concentration	Solution color	Nitrates concentration
LLC "Barcom"	«Salami»	Light - blue	> 0,001 mg/dm^3	Light – blue	> 0,001 mg/dm^3
TD " Myasna gilidiia "	«Likarska», «Zolote telia»	Light – blue	> 0,001 mg/dm^3	Blue	> 1 mg/dm^3
"Singurivski kovbasy" factory	«Likarska»	Light – blue	> 0,001 mg/dm^3	Blue	>100 mg/dm^3

The table shows, that nitrate content in selected samples of domestically produced sausages is less than 1 mg / dm^3. This result corresponds to the normative values which are regulated by GOST 8558.2 - 78 "Meat products and a method of determining nitrate ". Taking into consideration the properties of nitrates and their possibility to participate in the synthesis of carcinogenic nitrosamines, the amount of

nitrate in the products is strictly limited. Considering the potential danger of nitrate and complexity of regulation of nitrosopigments formation reactions, the use of salts of nitric acid in pickling meat (forcemeat) is currently not allowed. At the same time, the probability of converting nitrite to nitrate is not excluded; it causes the need to control salt content of nitric acid in meat products. Thus, for rapid assessment of nitrate levels in sausages, except the indicator paper "Indam", a high-quality reaction with diphenylamine, which is quite sensitive and effective, can be applied.

UDC 504.062

V. Vinskyi, student of the 3-rd course,
T. Kamskikh, senior lecturer, research advisor,
S. Sukhovetska, language advisor
Zhytomyr State Technological University

WATER QUALITY ASSESSMENT OF THE TETERIV RIVER

Zhytomyr oblast is entirely located in the ambit of the basin of the Dniper River. The total quantity of rivers in the region is 2818 with the total length of more than 13.7 thousand km. According to the classification structure of hydrographic system, there are eight medium-sized and no big rivers in the region. The largest part of the region belongs to the basin of the right tributary of the Dniper; 38% of the region's territory is situated in the basin of the Teteriv River. The length of the river is 385 km, the basin area is of 15300 square kilometers. The river flows within Chudniv, Romaniv, Zhytomyr, Korostyshiv and Radomyshl' rayons of Zhytomyr oblast, as well as Ivankiv rayon in Kyiv oblast; and then it flows into Kiev water-storage reservoir. The riverheads are not far from the borders of Zhytomyr and Vinnytsia oblasts, southward from the village Nosivka at the altitude of 299 meters. Because the head of the Teteriv is located on Podillia upland sometimes it has the features of a mountain river. The river has mixed water sources with a predominance of a snow inflow. More than 50% of the river flow consists of snow melt water. River ice formation begins usually in late November - early December and the release from ice is in mid-March. An average freeze time is about 3- 4 months with an average thickness of ice - 0.2-0.5 m. The spring flood increases the river level to 5.2 meters. In some places water spreads in wide to several kilometers and floods low-lying shores. The Teteriv River has a fairly long period of high water - up to the 1st June.

To determine the influence of the city on the river system, this water body was being examined at two observation sites during the period from 2012 to 2014 year. The choice of sampling sites was performed as following: range number 1 - sampling area which is located higher up the town (4.5 km) at the reservoir "Vidsichne". This sampling site allows drawing conclusions about the water quality in the river. The second range - sampling site located lower down the city Zhytomyr (2.5 km). This sampling site allows the quality of water flowing through the city to be evaluated.

Such arrangement of sampling sites allows evaluating correctly the water quality of the river at different areas.

The characteristic of water quality of the Teteriv river is evaluated according to the environment quality classification of surface water. It includes a wide range of hydrobiological, hydrochemical and hydrophysical indicators that reflect the features of abiotic and biotic components of aquatic ecosystems [1].

Generalization of water quality assessment by individual indicators with the definition of integral values of classes and categories of water quality is done by analyzing the indicators within scopes of the relevant units: A - indicators of salt content; B – tropho-saprobiochemical (ecological and sanitary) indicators; C - specific indicators of toxic and radiation exposure.

Sampling was conducted according to the current regulations [3, 4, 5]. Clean cups with the volume of 1 dm^3 and dark glass cups with frayed lid were used for storage and transportation of water samples. Water samples were not conserved. The results of hydrochemical measurements and the normative documents on the carried out investigation are given in the table №1.

Table 1

The results of hydrochemical measurements of water samples from the Teteriv River (the average value for the period of investigation)

№	**Name, units of measurement**	Results of measurement		**SanPin 4630-88* MAV**	**Techniques for measurement****
		Range №1	**Range №2**		
1	*2*	*3*	*4*	*5*	*6*
2	Temperature, °C	12,6	12,8	Not rated	MVV 081/12-0311-06
3	Hydrogen indicator, pH	7,5	7,7	6,5-8,5	MVV 081/12-0317-06
4	Dry sediment, mg / dm3	180	144	1000	KND 211.1.4.042-95
5	Suspended solids, mg / dm3	3,20	3,50	0,75	KND 211.1.4.039-95
6	Permanganate oxidation mg O/dm3	1,80	2,00	Not rated	MVV 081/12-0016-01
7	Chem. consumption of Oxygen (COD) mg O2/dm3	3,20	3,30	15,00	KND 211.1.4.021-95
8	Biochemical consumption of Oxygen (BOC5) mg O2/dm3	2,60	4,00	4,00	KND 211.1.4.024-95
9	Dissolved oxygen, mg/dm3	15,70	16,70	More then 4,00	MVV 081/12-0008-01
10	Ammonium salt, mg/dm3	0,08	0,19	1000	MVV 081/12-0106-03
11	Nitrite mg/dm3	0,02	0,06	3,30	KND 211.1.4.023-95
12	Nitrates mg/dm3	20,02	20,40	45,00	MVV 081/12-0651-09
13	Phosphates mg/dm3	0,18	1,75	3,50	MVV 081/12-0005-01

14	Surfactants, mg/dm3	0,02	0,05	Not rated	KND 211.1.4.017-95
15	Iron, mg/dm3	0,30	0,30	0,30	KND 211.1.4.034-95
16	Sulfates, mg/dm3	13,2	13,45	500	MVV 081/12-0007-01
17	Chlorides mg/dm3	6,30	7,20	350	MVV 081/12-0653-09
18	Hardness, mg/dm3	1,80	2,90	Not rated	MVV 081/12-0006-01
19	Calcium, mg/dm3	60,9	65,8	Not rated	MVV 081/12-0006-01
20	Magnesium, mg/dm3	9,83	9,60	Not rated	MVV 081/12-0006-01
21	Manganese, mg/dm3	0,05	0,05	0,10	MVV 081/12-0416-07
22	Copper, mg/dm3	0,003	0,003	1,00	MVV 081/12-0648-09
23	Zinc, mg/dm3	0,002	0,003	1,00	MVV 081/12-0413-07
24	Lead, mg/dm3	0,006	0,006	0,03	MVV 081/12-0414-07
25	Nickel, mg/dm3	0,005	0,005	0,10	MVV 081/12-0649-09

* 4630-8804.07.1988 SanPiN "Sanitary rules and protection norms of surface waters against pollution." ** GOST rules and techniques for water measurement.

The biggest contribution to the deterioration of water quality both down and upstream belongs to nitrogen compounds and heavy metals. Having analyzed the values of surfactants (from 0.02 to 0.05 mg / dm3), nitrates (from 20.02 to 20.40 mg / dm3), phosphates (0, 18 to 1.75 mg / dm3) and sulfates (from 13.2 to 13.45) it can be denoted that beyond the city (range№ 2) water quality deteriorates. According to these indicators, water quality in the Teteriv river reduces by 1-2 category.

Water quality assessment in terms of its salt composition indicators shows that according to pollution criteria, the river water is of the I quality class of the lowest indicators and it occupies a transitive position from the I to the II class of the worst indicators.

General environmental index (GEI) was calculated according to the recommendations. [2]. Minimum values of GEI for water samples at the range №1fluctuated from 2.8 to 3. GEI values of water samples from range № 2 were the worst: from 3.3 to 3.5. Average values of this indicator for all study period ranged from 3.1 to 3.3; such values characterize the water as clean enough. The values of certain block parameters in water samples higher up and lower down Zhytomyr were, respectively, the following: I(s) = 1,8 and 2,0; I(ts) = 3,1 and 4,2; I(t) = 3,6 and 3,9.

Hydrochemical state of the river Teteriv hadn’t extremely altered during the survey period. The content of dissolved oxygen was satisfactory: within 15,70-16,70 mg O2/dm3 (at the rate of at least 4.0 mg/dm3).

Compared to the previous years, inconsiderable deterioration of the following indicators was seen: COC - 3.20 - 3.30 against of 3.00 mg O2/dm³ and BOC - 2.60 - 4.00 against of 3.30 mg O2/dm³. Other indicators did not significantly alter; the general state of the river remains stable.

The results of the surface water radiological analyzes on 137Cs and 90Sr [6] contamination show that the content of the controlled radionuclides in drinking water samples during the indicated period was lower than the established criteria for drinking water. Thus, 137Cs concentration was 0.001 Bk/m3, and 90Sr concentration - 0,008 Bk/m3 compared to the controlled pollution levels - 2,000 Bq/m3.

The three-year monitoring of water quality in the river Teteriv revealed the following: in general, the quality of the river water meets the MAC norms for community water use; according to defined environmental index, indicator values show that water is clean enough; water quality in terms of its salt composition indicators is considered to be transitive (from the I to the II class); and the indicators of tropho-saprobiological block transit from – the III to the IV quality class; according to the indicators of substances from the specific block of components which can cause radioactive and toxic contamination, river water belongs to the I-st water quality class. Generally, the river Teteriv water corresponds to the II class of water quality.

But it is worth noting that over the past three years, the water pollution of the Teteriv has increased slightly. This is mainly due to insufficient cleaning and even non-cleaning of wastewater of municipal and industrial companies in the region. This problem needs for regular monitoring of water quality in the river Teteriv.

REFERENCES

1. SEV "Unified methods of water quality investigation " .- Volume 1, Part 1. - M., 1987. - 302 p .;

2. Methodology of environmental assessment of surface water quality under the relevant categories. Approved by the Ministry of Environmental Security of Ukraine from 03.31.98 g. №44 and agreed with the state hydrometeorological center of Ukraine / Authors: Romanenko VD, Zhulinsky VM, AP Oksijuk etc. - K.: CHAR-T 1998-48p .;

3. Hydrochemical guide. Surface water of Ukraine. Hydrochemical calculations. Methods of analysis / VI Osadchiy, BI Nabyvanets, NM Osadcha, JB Nabyvanets. - K .: Nika Center, 2008.- 656p .;

4. CPV 21.1.4025-95 Environmental Protection. Quality of measurement of object's composition and properties of the environment and sources of pollution. Official Publication. - K., 1997.-663p .;

5. GOST ISO 5667-2001 Part 6. Guidance on sampling of water from rivers and other watercourses. Part 3: Guidelines for the storage and handling of samples.

6. Zhytomyr regional management of water resources. http: // zouvr.gov.ua/monitoring.html.

UDC 622.68

Ya. Vozniuk, Master student
O. Tolkach, PhD in Engr., research advisor
S. Sukhovetska, language advisor,
Zhytomyr State Technological University

THE FEATURES OF A COMBINED SCHEME APPLICATION IN TRANSPORTATION OF ROCK MASS IN THE QUARRIES OF ROUGH GRAVEL RAW

Every year the volumes of crushed stone production are increasing. It is due to the fact that the volumes of construction roads, housing and buildings are also increasing in the world.

When a quarry depth increases, the transportation distance and the volumes of rock mass also increase which, in turn, increases production costs and reduces competitiveness. Mining companies have to modernize production by reconstruction of the existing and introduction of new technological lines with the use of effective methods of blasting and modern crushing equipment.

Different kinds of transport, such as railway, vehicle, conveyor, hydraulic, cable and air transport are independently or in combinations used in a quarry. At major quarries of Ukraine, vehicle transport is used for transportation of rock mass. With the increase of the transportation distance the effectiveness of a certain type of transport dramatically reduces. Therefore, there is a need for the use of such combined schemes of transportation of rock mass which would provide the design capacity of the quarry and, if necessary, increase it.

The combination of mining transport allows to accelerate the preparation of deposits for operation, to intensify mining and stripping operations and to obtain the greatest technical and economic effect.

Quarry transport should meet following requirements: ensuring a certain freight turnover and continuous operation; lessening labor-intensive operations; providing traffic safety and maintenance of work.

Such factors as the characteristics of the cargo transported, the distance of transportation, the scope of work and the pace of their development influence on the choice of quarry transport. The capacity of vehicles depends on the freight turnover; and the pace of mining operations determines the requirements for maneuverability of vehicles.

The use of combined transport scheme provides reduction in fuel costs, reduction of personnel, as well as improvement of working conditions for people in a quarry and environment safety. Combined transport scheme allows operating in the most favorable conditions. Thus, the type of the vehicle, the assessment of its basic parameters and technical-economic indicators are of great importance.

Taking into consideration the mining-technical and mining-geological conditions, it is advisable to use the automobile-conveyor transport for the haulage of the rock mass at LLC "Vury quarry". Now, the depth of the quarry reaches 66 m and the distance of transportation within the open quarry is 1 km. The rock mass from the

excavated bottom is transported by dump trucks to the bunker of jaw crusher located in the quarry on the horizon with a mark of +132. Crushed rock mass with the fraction of 0-400 is transported to an accumulation warehouse by the inclined conveyor (angle 14º) with a length of 436 m to the elevation height of 100 m. This rock mass is further processed to produce crushed stone of different fractions. The product of primary crushing with 0-32 fraction is screened and transported by a conveyor to store it temporary in the quarry.

The use of cyclic-flow technology in open-pit mining is helps to increase (compared with cyclic) efficiency, to reduce costs for deposit development, to increase the productivity of excavators, to reduce by several times the need for powerful trucks, to minimize losses during transportation of the rock mass, to maintain rock mass quality and to reduce negative impact on the environment (namely the amount of dust and gas by reducing the number of loading machines).

The performance of cyclic-flow technology depends on the size of blasted rock mass. Therefore, the requirements to the quality of the rock mass in cyclic-flow technology are increased. The maximum size of a piece, which can be processed by a jaw crusher Sandvik C160 can reach only 1.6 m.

For cost-effective transportation of rock mass by the automobile-conveyor transport, the scope of its application should be correctly justified. Also, efficient conditions for vehicles should be ensured, which depends on the number and the location of transshipment points in a quarry. The parameters of the automobile-conveyor complex are: the height, the distance, the volume of rock mass transportation by automobile and conveyor transport, the number of transshipment points. These parameters depend on the volume of the rock mass, mined in the stages of quarry development.

UDC 621.91

V. Vysotskyi, Master student,
V. Nochvai, PhD in Engr., Ass. Prof., research adviser
I. Melnychenko, lecturer, language advisor
Zhytomyr State Technological University

RESEARCH OF DEPENDENCE OF CARBIDE CUTTERS ESISTANCE ON THEIR GEOMETRICAL PARAMETERS IN THE SPRAYED COATINGS PROCESSING

Among the materials used for spraying, resistant self-fluxing alloys based on nickel, cobalt and copper, and mixtures of chromium carbides and borides, tungsten, titanium and others play an important part. These materials resist abrasive wear in chemically active environment at normal and high temperatures. They are temperature-resistant, heatproof, work well in pairs of metal-metal friction with different oils.

Chemically resistant coatings on nickel base of self-fluxing alloys belong to a class of hard materials. The hardness of the sprayed coating depending on the powder brand is in the range of 35 ... 64 HRCe.

The current practice of processing of hard wear-resistant coatings is based mainly on the use of abrasive machining methods. The use of grinding is justified, but the processing of wear-resistant coatings accompanied by formation of scorching, grinding cracks impairs the operational properties of the treated surface. Peculiarities of cutting cover are determined by their structure and properties, the presence of significant macro deviations; structure and chemical heterogeneity; the difference in hardness; low plastic properties; high porosity; presence solid inclusions in the material; significant oxidative layer on the surface. In this regard, the coating treatment is accompanied by reduced resistance tool, a high temperature in the cutting zone, chip formation and cleavage significant fluctuation cutting forces.

Geometrical cutters significantly affect the process of cutting layer strain, force and cutting temperature, intensity of wear, and therefore the stability of the incisors. The improvement of the technical and economic parameters of processing of solid sprayed coatings can be achieved by selecting the optimal values of the geometric parameters of the tool. Since the stability of the tool depends on its geometric parameters, the increase of its stability when processing sprayed coatings by choosing the optimal values of the geometric parameters of the tool is an urgent task.

The aim of research is to improve the stability of the tool in the processing of wear-resistant sprayed coating of Ni-Cr-B-Si system.

The aim of the study is to determine the stability of cutters depending on their geometrical parameters.

Research of the dependence of the tool sustainability on its front angle. Research of the dependence of the lathe tool resistance on its front angle γ is performed in the processing of sprayed coatings on the basis of self-fluxing alloy PG-SR2. Coatings were sprayed by flame method on samples of steel 45 with a diameter of 50 mm and a length of 500 mm. Covering hardness is 40 ... 45 HRCe. The thickness of the coating layer is.5 mm.

Experiments were conducted on screw-cutting lathe 16K20 without cooling the external longitudinal turning. Hard alloy tools VK3 were tested.

Coating processing was performed in the following modes: cutting speed - V = 22,6 m per min, V_2 = 35,3 m per min, feed - S = 0,15 mm per rev, cutting depth - t = 0,2 mm.

Wearability on the back surface of the tool was taken as the blunting criterion. Measuring of the value of area operation was carried out with the Brinell magnifying glass. Limit value of wear on the back surface was set equal to 0.4 mm.

Input factor is a front cutter angle γ set at a given level (Table. 1). The initial factor is the stability of the tool τ. The result of the experiment is the values of output factor (Table. 1).

Table 1

Measurement results of tool sustainability

Research number *i*	Cutter front angle γ, degree	The stability of the tool at cutting speeds V_1 = 22,6 m per min., τ, min.	The stability of the tool at cutting speeds V_2 = 35,3 m per min., τ, min.
1	-5	50	16
2	0	42	24
3	+15	28	12

Research of the dependence of the tool sustainability on its main angle in the plan. Research of the stability of turning tools on the main angle φ is made in terms of the processing of sprayed coatings on the basis of self-fluxing alloy PG-SR2. Coatings were sprayed by flame method on samples of steel 45 with a diameter of 50 mm and a length of 500 mm. Covering hardness is 40 ... 45 HRCe. The thickness of the coating layer is 1.5 mm.

Experiments were conducted on screw-cutting lathe 16K20 without cooling the external longitudinal turning. Hard alloy tools VK3 were tested.

Coating processing was performed in the following modes: cutting speed - V = 22,6 m per min, feed - S = 0,125 mm per rev, cutting depth - t = 0,2 mm.

Wearability on the back surface of the tool was taken as the blunting criterion. Measuring of the value of area operation was carried out with the Brinell magnifying glass. Limit value of wear on the back surface was set equal to 0.4 mm.

Input factor is a main angle in the plan φ set at a given level (Table. 2). The initial factor is the stability of the tool τ. The result of the experiment is the values of output factor (Table. 2).

Table 2

Measurement results of tool sustainability

Research number *i*	Main angle in the plan φ, degree	Tool sustainability τ, min.
1	30	58
2	90	40

According to the results of research presented in Tables 2 and 3, histograms of dependencies of turning tool resistance in the processing of sprayed coatings on its geometrical parameters are built (see. Fig. 1, 2).

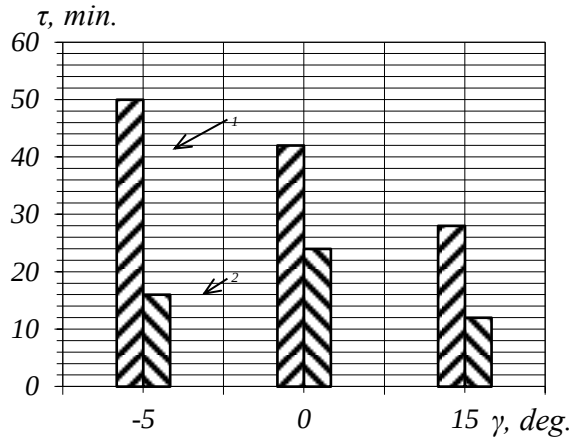


Figure 1. Dependence of τ tool stability on its front angle in the plan γ at cutting speeds:
1 – 22,6 m per min.; *2* – 35,3 m per min.

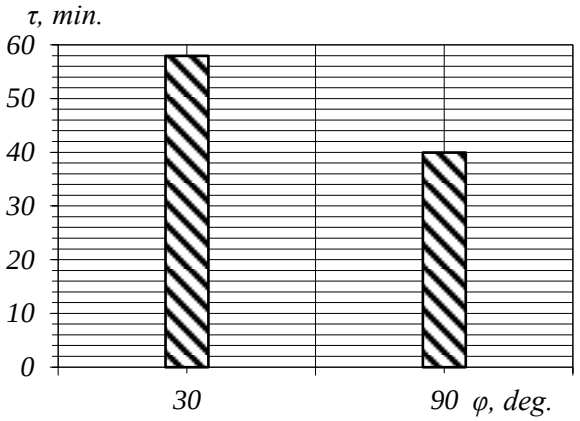


Figure 2. Dependence of τ turning tools stability on the main angle in the plan φ

Conclusions.

1. The studies found that with increasing of front angle of cutter its resistance decreases.

2. The studies found that with the increase of the main angle in the plan the stability of the tool decreases.

3. Since the processing of wear-resistant sprayed coatings between resistant carbide cutters and geometrical parameters of the tool there is a connection, so it makes it possible to determine the optimal values of these parameters.

UDC 726.04

N. Yatsunova, postgraduate student
P. Rychkov, Doctor in Architecture, Prof., research advisor
M. Tadeieva, Doctor of Pedagogy, language advisor
The National University of Water and Environmental Engineering

ARCHITECTURE OF GERMAN COLONIES IN VOLYN ON THE MATERIALS OF THE "WOLHYNISCHE HEFTE" NEWSLETTER

The origin, evolution and architecture of the German settlements in the Volyn region is understudied while the available literary sources offer a partial view of this

issue, omitting the architectural aspects of the constructions in German colonies in Volyn. Therefore, the "Volyn" Historical Society which was established in Wiesentheid (Germany) in 1980 plays an important role in the study of the origins of the Volynian Germans. "Volyn" has published fourteen volumes of the collection entitled "Wolhynische Hefte" ("Volyn Notebooks") since 1982. Memories of the former colonists, their poems and stories about Volyn are of great interest. Maps indicating the location of German colonies in provinces and districts as well as maps of individual colonies are published here. Research articles on various aspects of history of the Volynian Germans are based on the documents from the archives of Germany and Zhytomyr regional archives. These materials deal with the lives of nearly 300,000 Germans who lived in Volyn in the period of 1940-1943. They were mostly farmers and craftsmen whose ancestors came to the region in the 19th century. A considerable number of articles in the "Volyn Notebooks" are devoted to the issues describing planning and composition of settlements and architecture of the Volynian Germans.

The article by Nikolaus Arndt "Colony of Koryst. The origin, development and disappearance of a rural settlement in the center of Volyn which existed from 1867 to 1940" [1, p. 5-41] from the first collection of the "Volyn Notebooks" contains interesting information in terms of architecture and urban planning. It was one of the youngest and the richest German settlements in Volyn. The author describes the religious situation in the settlement. The church-house was combined with the school here. The settlers were engaged in flour milling and hop cultivation, building air and water mills. The first air mill in the colony was built in 1875.

The article by Walter Kuhn "The origin of Volynian Germans" [2, p. 19-29] from the second collection allows the reader to understand the overall picture of migration of the Germans to Volyn, their origin and establishment of the first settlements.

The article by Josef Weiss "Temporary Motherland - the school community of Julianiv-Boryatyn, 1875-1940." [3, p. 34-65]. The author uncovers the origin of the names of colonies that were formed near Torchyn. The German colony named Julianiv appeared in 1875. The community of Yulianiv built a church-house with a bell tower nearby. A new school combined with an apartment for a cantor was built in 1909. Moreover, most old houses were replaced by new ones and brick houses with tin roofs also appeared. After World War I almost all buildings were destroyed, neither the school, nor the bell tower, nor the church-house was preserved.

The article by Friedrich Ritz "Old Motherland of Milashiv of the Lutsk district; including a list of residents and the area plan" [4, p. 76-79]. Milashiv is a German colony founded in 1882. The church-house was built in 1930; its location can be seen on the map. The other articles of the second collection of the "Volyn Notebooks" contain some interesting information about the history of the Germans in Volyn.

The article by Reinhold Jungton "My native colony of Apanovchyzna near Volodymyr" [5, p. 174-180] from the third collection. The settlement was located 25 kilometers east of Volodymyr. It was a linear composition colony where the households were situated along the sides of the street. The author also attaches his own plan of the area. The plans of such colonies as Oleshkovychi, Topcha, Apanovchyzna and Koryst from the appendixes to the third collection of the "Volyn Notebooks" cannot be underestimated in the study of town development [6].

The article by Robert Jans “German settlement Brysche I” (with an area plan by Arnold Jans) from the fourth collection [7, p. 170-178]. The linear colony was founded about 1875 and in 1900 it housed 45 families. The German community built a school with a prayer hall. This publication provides a schematic map by Nikolaus Arndt on transmigration of the Volynian Germans into Russia during the World War I [8] and the general plan of eight colonies which was developed by Augustus Scheps [9, p. 231]. These colonies are Romaniv I, II, Novi and Stari Verhy, Olshaniv, Mykhailivka, Zapust, Boryatyn, Marianivka and Eleniv.

The fifth collection of the “Volyn Notebooks” is rich in plans of German settlements. [10] It includes the general plan of colonies near Volodymyr which existed from 1760 to 1939 and a separate plan of Lyudmirpol colony. Plans of areas with lists of residents and brief chronicles of individual colonies: Vandavolya, Barbariv, Bozhavolya, Svichov, Vladyslavivka, Jadvihov, Prehalivka, Evin, Antonivka of Vlodymyr-Volyn district. The plan of such colonies as Hlynysche, Uzhova, Karolynivka, Novi and Stari Verhy with a brief description of the German resettlement and a list of residents. The plan of Alexandrivka colony which indicated the location of an Evangelical church, a cemetery and a school. All the plans let us imagine the overall picture of development and planning of German settlements as well as location of the main elements in the structure of a settlement.

The article by Gertrud Sirkvits “My childhood in Lutsk” [11, p. 104-123] from the sixth collection discloses the overall picture of schooling, types of schools that existed at the time. The author mentions the German school, which was located in the yard of an Evangelical church near pastor’s house and the church itself, which was a beautiful dominant in the texture of the city. The life and customs of the Evangelical community in Lutsk which consisted of 2,000 people are described and the main reasons for the eviction of the Germans in 1939 are disclosed. In this collection there are plans of many colonies. [12] The plan of the colony named Zelena together with a brief description and a list of residents. Plans of the colonies named Jamky and Meczyslaviv of the Torchyn curacy of the Lutsk district, Yaniv, Karolinovka, Neudorf and Olyka supplied by the lists of residents. The plan of Schytnik colony of the Kovel district with a church which wasn’t preserved. The general plan of the colonies Dombrowa, Olshaniv, Zadombrova and Zaostriv of the Lutsk district with a list of residents.

The article by Bogdan Kolosok “Evangelical church in Lutsk - the origins and reconstruction” [13, p. 63-65] from the seventh collection deals with the history of a German church in Lutsk which was opened on September 19, 1907. A vicarage was built nearby. The entire architectural ensemble was constructed in Neo-Gothic style with a bell tower of the church as its central element and an integral part of the city silhouette. Like most religious buildings the church was closed in Soviet times.

The seventh collection [14] contains plans, short chronicles and lists of residents of the following colonies: Dombrowa of the Volodymyr district, Machulky of the Rivne district, Milashiv of the Lutsk district, Kryvuli, Mykhailivka of the Lutsk district, Marianivka, Eleniv, Stari Verhy, Zhychynek, Karlinkov, Bronyslav and Subilno.

The article “Fasova Rudnia” by Leonard Kremring [15, p. 27-56] from the eighth collection of the “Volyn Notebooks” is a short chronicle of a German village

in the Volodarsk-Volyn area of the Zhytomyr district. Fasova Rudnia was founded in 1875 as a colony with German management.

The article by Albert Mueller "Kadysche colony - chronicles, residents and area plan" [16, p. 32-40] is prominent in the ninth collection [17]. A large number of articles concerns travels of German colonists to Volyn in 1985-1993 to visit the settlements that were their homes in the past. The authors of the articles compare current settlements with those existing prior to their eviction from Volyn before World War II, they identify the buildings which survived until present time and those which disappeared and convey their emotions and feelings.

The tenth collection of the "Volyn Notebooks" [18] contains three articles devoted to memories of Rivne from 1860 to 1939. These are short memories of Volodymyr Korolenko about his meetings with the Germans and people of German origin, a story by Peter Zinner about the life of a Volga German journalist and teacher in Rivne, and a description by Nikolaus Arndt about German timber merchants.

The story by Elfriede Ebius "My father was a traveling pastor in Volyn. Memories of his youth in Tuchyn and Rivne" [19, p. 44-57]. The author recalls the years in a small Jewish town of Tuchyn, namely in its German suburb called "On the Sands". Special attention should be granted to the description of the church-house, an oblong construction with a prayer hall in one half of it and a classroom with a teacher's flat in the other. The article also describes the modest interior of pastor's house and gives a general idea of basic elements of the furniture.

In the eleventh collection of the "Volyn Notebooks" the article by Andriy Bandura "Brief history of a church in Oleshkivtsi near Lutsk" [20, p. 79-80] is important in terms of architectural history. This collection [21] contains several articles on the history of several German colonies: the story by Ronald Neumann about the German settlement Rohivka near Zhitomir; Reinhard Shedler's article about Kolovert colony near Tuchyn with an area plan and a list of residents. The article by Johan Kruger "A church building in Velyke Pole colony" [22, p. 156-160] describes a new wooden church opened on October 10, 1936.

In the twelfth collection of the "Volyn Notebooks" the article by Leonard Kremring "Scientific and social life of the Germans in eastern Volyn. Memories and impressions." [23, p. 73-98] contains interesting information about farming and agriculture of the Volyn Germans, including some specific features of their household buildings, metal workshops and separate households involved in leather processing. The yards of settlers had no stated planning. The author focuses on the description of traditional German dwelling and gives detailed description of the premises, their size, etc. He concludes that German houses contained much more rooms compared to Ukrainian houses. The author emphasizes the religious aspect of life of the Volyn Germans. In every new colony there was a place for the future church and school. They could be two separate buildings or a church-house with a school and an apartment for a custos.

This collection [24] contains brief chronicles with descriptions and plans of colonies Mykhailivka near Derazhno and Neudorf (with a brick Baptist church).

The article by Hubert Zerbe "Kostopil and its German Evangelical community" [25, p. 37-49] from the thirteenth collection of the "Volyn Notebooks" deserves special attention. It describes the formation of an Evangelical community in Kostopil and the construction of a church which was completed in 1926. In 1937 the

construction of pastor's house began and it was completed before the World War II. Kostopil Church was the largest wooden German church on the territory of Volyn. Some articles from this collection [26] are devoted to stories about the colonies: short chronicles of Solodyri colony and the villages surrounding it; an area plan with a list of residents of Antoniev colony of the Rivne district; a plan of Antoniev colony of the Volodymyr-Volyn district; a plan and a list of residents of the settlement of Kamianka.

Only some materials from the fourteenth collection of the "Volyn Notebooks" [27] relate to architectural issues. These are individual plans and brief descriptions of the colonies.

REFERENCES

1. Arndt N. Kolonie Korist – Entstehung, Entwicklung und Auflösung einer deutschen Bauernsiedlung im mittleren Wolhynien in den Jahren 1867 – 1940. // Wolhynische Hefte. 1 Folge. – Schwabach, Wiesentheid., 1979. – s.5-41.
2. Kuhn W. Die Herkunft der Wolhyniendeutschen – Nachdruck aus dem Wolhynischem Volkskalender 1937. // Wolhynische Hefte. 2 Folge. – Schwabach, Wiesentheid., 1982. – s.19-29.
3. Weiss Josef, Heimat auf Zeit – Die Schulgemeinde Juljanow-Boratyn 1875 – 1940 (mit Nachtrag von Ewald WEISS); Karte mit Einwohnern hierzu in Folge 3. // Wolhynische Hefte. 2 Folge. – Schwabach, Wiesentheid., 1982. – s.34-65.
4. Ritz Friedrich. Die alte Heimat Milaschow, Kreis Luzk. // Wolhynische Hefte. 2 Folge. – Schwabach, Wiesentheid., 1982. – s.76-79.
5. Jungton R. Meine Heimatkolonie Apanowczyzna, bei Wladimir. // Wolhynische Hefte. 3 Folge. – Schwabach, Wiesentheid, 1984. – s.174-180.
6. Wolhynische Hefte. 3 Folge. – Schwabach, Wiesentheid, 1984. – s.180.
7. Jahns R. Die deutsche Siedlung Bryschtsche I (dazu JAHNS A., Ortsplan). // Wolhynische Hefte. 4 Folge. – Schwabach, Wiesentheid., 1986. – s.170-178.
8. Wolhynische Hefte. 4 Folge. – Schwabach, Wiesentheid., 1986. – s.231.
9. Scheps A. Acht Kolonien nördlich von Tortschin (Listen der Hofbesitzer, mit Karte der Kolonien: Romanow I+II, Neu + Alt Werchy, Olszanow, Michailowka, Sapust, Boratyn, Marianowka, Helenow). // Wolhynische Hefte. 4 Folge. – Schwabach, Wiesentheid., 1986. – s.228-231.
10. Wolhynische Hefte. 5 Folge. – Schwabach, Wiesentheid., 1988. – s.248.
11. Zirkwitz G. Wie ich als Kind Luzk erlebte. // Wolhynische Hefte. 6 Folge. – Schwabach, Wiesentheid., 1990. – s.104-123.
12. Wolhynische Hefte. 6 Folge. – Schwabach, Wiesentheid., 1990. – s.194.
13. Kolossok B. Die Evangelische Kirche in Luzk – Geschichte der Entstehung und derzeitige Restaurierung. // Wolhynische Hefte. 7 Folge. – Schwabach, Wiesentheid., 1992. – s.63-65.
14. Wolhynische Hefte. 7 Folge. – Schwabach, Wiesentheid., 1992. – s.193.

15. Kremping L. Fassowaja Rudnja - Chronik einer großen Kolonie nördlich von Shitomir mit ihrem Schicksal in der Sowjetzeit. (Verzeichnisse S. 148-158). // Wolhynische Hefte. 8 Folge. – Schwabach, Wiesentheid., 1994. – s.27-56.
16. Müller A. Kolonie Kadyschtsche – Chronik, Einwohner und Ortsplan. // Wolhynische Hefte. 9 Folge. – Schwabach, Wiesentheid., 1995. – s.32-40.
17. Wolhynische Hefte. 9 Folge. – Schwabach, Wiesentheid., 1995. – s.133.
18. Wolhynische Hefte. 10 Folge. – Schwabach, Wiesentheid., 1996. – s.142.
19. Oebius E. Mein Vater war Reisepastor in Wolhynien. Jugenderinnerungen an Tutschin und Rowno. Aus: "Heimat in der Fremde". Deutsche aus Russland erinnern sich (Tochter von Pfarrer Ernst Althausen). // Wolhynische Hefte. 10 Folge. – Schwabach, Wiesentheid., 1996. – s.44-57.
20. Bandura A. Kurze Geschichte der Kirche von Oleschkowytschy bei Luzk. // Wolhynische Hefte. 11 Folge. – Schwabach, Wiesentheid., 1998. – s.79-80.
21. Wolhynische Hefte. 11 Folge. – Schwabach, Wiesentheid., 1998. – s.173.
22. Krüger J. Bau einer Kirche in der Kolonie Welyke Pole (Auszug). // Wolhynische Hefte. 11 Folge. – Schwabach, Wiesentheid., 1998. – s.156-160.
23. Kremring L. Aus dem wissenschaftlichen und gesellschaftlichen Leben der Deutschen in Ostwolhynien. Erinnerungen und Erlebnisse. // Wolhynische Hefte. 12 Folge. – Schwabach, Wiesentheid., 2000. – s.73-98.
24. Wolhynische Hefte. 12 Folge. – Schwabach, Wiesentheid., 2000. – s.162.
25. Zerbe H. Kostopol und seine deutsch-evangelische Gemeinde. // Wolhynische Hefte. 13 Folge. – Schwabach, Wiesentheid., 2003. – s.37-49.
26. Wolhynische Hefte. 13 Folge. – Schwabach, Wiesentheid., 2003. – s.202.
27. Wolhynische Hefte. 14 Folge. – Schwabach, Wiesentheid., 2007. – s.167.

UDC 622.35

I. Yurchenko, Master student
S. Sukhovetska, language advisor
Zhytomyr State Technological University

STUDY OF THE INFLUENCE OF ROCK MASS QUALITY ON THE PRODUCTIVITY OF THE EXCAVATOR-AUTOMOBILE COMPLEX

Major industrial potential of the country is the mining of mineral raw materials, which is provided by the development of mineral deposits. Currently, the industrial needs in solid raw material are satisfied by open-pit mining. Mining is an energy

intensive process; it involves a large number of different mining and transport techniques.

The vast majority of quarries of Ukraine aimed at the production of building materials. Crushed stone is one of the most common materials used in various fields of construction.

Much attention is paid to the investigation of the influence of the granulometric composition of blasted rock for further processing with the aim to reduce the total energy consumption for the destruction of minerals in the preparation of their enrichment. However, the dependence between the degree of the array crushing and the economic performance of the subsequent processes of excavation and transportation of overburden rock is not studied enough.The efficiency of the following technological processes depends on the quality of blasting. To estimate the value of the rational costsfor explosive destruction of overburden rock, theinfluence of the degree of array crushing on techno-economic indices of quarry and transport equipment performance should be determined.

There is a number of publications devoted to the influence of explosive preparation of rock mass to the excavation on the technical and economic indicators of thefollowing processes: secondary crushing, excavation and loading works, rock mass transportation and laying of rocks to the dump. To shorten the duration of ladling andto increase the ratio of the bucket filling it is necessary to increase the coefficient of loosening, which, in turn, depends largely on the degree of the array crushing.

The degree of the massif crushing has the most significant impact on technical and economic performance of the quarry operation and may be expressed in a quantitative value. Requirements for the size and shape of the rock mass collapse depend on the technology and the equipment that is used.When blasting operations, the problem of outsized fractions remains. In this case, the maximum allowable sized piece of blasted rock mass is determined by the parameters of mining and transport equipment or the size of the receiving hole of the bunker.

There is no single criterion characterizing the rock mass structure by size. Very often, the composition of rock mass by size is characterized by a relative volume of large outsized pieces sorted for secondary crushing. Moreover, the output of outsized material is recommended to express in different ways. Usually, the percentage of outsized pieces is determinedby the ratio of outsized material to the blasted massif volume.

In quarries, the limiting parameter to determine the maximum size of outsized pieces is a maximum linear dimension of the excavator bucket or transport vehiclewhich is loadedby the rock mass.Using well-known dependencies, you can define the maximum allowable size of a piece of rock:

$$D_{\text{нег}} = 0{,}8 \cdot \sqrt[3]{\overline{E}}$$

$$D_{\text{нег}} = 0{,}7 \cdot \sqrt[3]{Vmp}$$

where E - capacity of the excavator bucket, m3 , Vтр - body volume of the dump truck m3 .

When transporting the rock mass to the surface, the formula to determine the outsized material will look like the following

$$D_{\text{нег}} = 0{,}75 \cdot B_{\text{конв}}$$

whereVconf - conveyor belt width, m3.

The rock mass lumpiness in a mine determines the duration of the dump truck loading and, as a consequence, the duration of the run, as well as the coefficient of a rock loosening in the vehicle body, and the rate of its filling. All these factors affect the load capacity of the truck. A number of scientific papers stdied the effect of rock masslumpiness on the duration of excavation cycle, the coefficient value of the excavator bucket and dump truck body performance, the complexity of a bottom cleaning and outsized material removal, as well as on the frequency of breakdowns and excavators downtime.

The average downtime of the truck duringsortingoutsized materialby excavator can be determinedtaking into account the total number of selected outsized material in the mine during the shift.The number of dump trucks, providing the shipment of the rock mass under the excavator should be also considered. The number of dump trucks, in turn, depends on the duration of the dump cycle, and the excavator loading.

The improvement of technical and economic indicators of the quarry operation can be achieved by improving the quality of drilling and blasting operations and a uniform grinding of rocks should also be considered. The main economic effect will be achieved by reducing costs for the crushing of the outsized material and by increasing the productivity of excavation and loading equipment. The direction of future research is the development of parameters of drilling and blasting, capable of providing a uniform crushing of the rock massif and conducting industrial-experimental studies. This allows to estimate the additional costs for drilling and blasting works and to confirm the economic impact, calculated on the basis of theory-based dependencies.

UDC 608.3

M. Zasteba, Bachelor Student
L. Stavytska, PhD, Senior Teacher, language advisor
National Technical University of Ukraine "Kyiv Polytechnic Institute"

BULK METALLIC GLASSES

The main theme of this topic is a realization of a superiority of amorphous metals and need of improving our knowledge about them.

We would like to start by describing the definition of BMGs. Bulk metallic glasses are thick layer materials made of amorphous metals, which means they have unstable structure. But how can we get this structure? Only different alloy systems can allow us to get amorphous structure when we will cool down such system. Because solids, when they are heated lose crystal shell so atoms can move freely and if temperature gradually decreases we have crystal shell but if the temperature decreases very fast, atoms can't get back to the previous form and create crystal shell, that's how BMGs are created. Also, when BMGs are heated they become very plastic so we can give them any shape is needed.

With such construction metal gains strength, corrosion resistance, conduction, durability bigger than most metals can possibly achieve. But with these advantages,

one problem appears: this kind of metals is hard to treat, that fact limits the ability of their using.

Experiments with tension showed, that metal glasses, despite the fact, that they are dominating, still can't withstand long-term forces applied (fatigue failure).

Where can BMGs be used? As applications, it is possible to mention golf clubs, knives, bridges, tennis rackets, various shaped mirrors, the casing of fragile things, vessels for soldering, airplane cover, antenna material, biomedical instruments, etc.

Most popular element for creating BMG alloys are zirconium, niobium, cuprum, lithium, nickel, iron, chrome, etc. Amorphization decreases with increasing Zr content in the powder blend.

Nowadays, scientists all over the world are working on creating a thicker BMG alloy, which human beings will use in their future life.

However, BMGs are very expensive materials commonly because they're made of expensive elements such as palladium and zirconium, and youth of this field of study as well.

REFERENCES

1. Hovrich S.V. Superplasticity and structure of bulk metallic glass VIT-1 by tensile plastic deformation in the supercooled liquid region / S. V. Hovrich , S. P. Stetsenko, Yu. E. Kupriyanova, O. V. Trembach, A. A. Vasiliev, O. V. Borodin. – Kharkiv. Access mode: http://vant.kipt.kharkov.ua/ARTICLE/VANT_2016_1/article_2016_1_65r.pdf.

2. Inoue A. Developments and Applications Of Bulk Metallic Glasses. Institute for Materials Research / A. Inoue, X.M. Wang and W. Zhang. – Japan : Tohoku University, Sendai, 2008. – 9 p.

3. Michael K. Bulk Metallic Glasses: An Overview / K. Michael, P. Liaw. – Springer US. – 290 p.

4. Jayalakshmi, S. Metallic Amorphous Alloy Reinforcements in Light Metal Matrices / Jayalakshmi S., Gupta M. – Springer International Publishing. – 112 p.

5. Suryanarayana C. Bulk metallic glasses / C. Suryanarayana, A. Inoue. – CRC Press is an imprint of the Taylor & Francis Group, 2011. – 565 p.

6. Bian Z. and Inoue A. New Ce-Cu-Al-Zn Bulk Metallic Glasses with High Oxidation Resistance / Bian Z. and Inoue A. – Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan: Rapid Publication – 4p.

Session work №2

CURRENT RESEARCH IN THE FIELD OF INFORMATION COMPUTER TECHNOLOGIES

UDC 62, 004.67

D. Beyrak, student
V. Chuhov, PhD in Engr., As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

DYNAMIC PLOT OF DIGITIZED DATA IN WOLFRAM MATHEMATICA 10

In spite of the fact that nowadays most of the modern physical quantity measuring devices are digital, for this kind of concerns analog devices are also used. Consequently, there raises the need for digitizing, saving and further use of the captured data. This can be done if a device has the analog output.

In this paper we will focus on the problem of convenient processing of the digitized data array drawing on the example of computation program Wolfram Mathematica 10, considering the typical steps of transforming an original set of values $\{a_1, a_2, \ldots\}$ into the graphic rendition. The issues of choosing and setting up the analog-digital converter are not covered here.

Besides having the actual set of values, it is also necessary to know the end values for every axis to be able to make a plot with correct scales. These values can be measured directly with the analog device and then taken into account in the program during the plotting.

Suppose the digitized signal is obtained in *.wav* format. Then to import it as a set of points in variable **`data`**, it is possible to use the **`Import`** function with specificator **`"Data"`**. For example:

```
data = Import["C:\\Directory\\file.wav", "Data"]
```

As a result, there have to be the set of the kind shown in Figure 1.

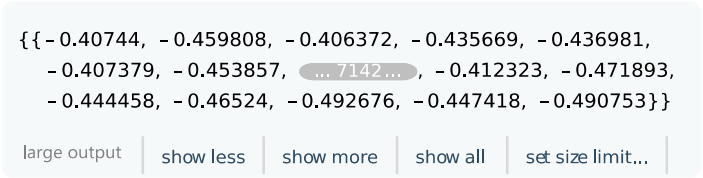


Figure 1. Imported set of values

Note that the original set of data can be stored in other formats. Visit the help page of the **Import** function to see the rest of the ways of importing by placing the mouse cursor on the function and pressing the "F1" key.

Sometimes it may be handy to normalize the set of original values in range from 0 to 1. This can be done by using the **Rescale** function. Besides that, the measurements are often made in logarithmic scale, so it is worth making delogarithmation of original set. These actions can be done with the following functions:

```
ndata = Rescale[data];
delogdata = 20^ndata;
```

Next, let us generate the set of points, which suits the scale of the x-axis. We will store the lowest and the highest axis points in variables **xmin** and **xmax** accordingly and use the **Range** function for obtaining the set. The **Length** function is used here for getting the cardinality value of the original set, and the equation, it appears in, defines the generating step:

```
xmin = 25.86; xmax = 37.5;
axisx = Range[xmin, xmax, (xmax - xmin)/Length[data[[1]]]];
```

Now let us construct the y-axis. To do this we will define the limits as in the previous example, but use the **Rescale** function for remapping the elements of the original, normalized or delogarithmized set pursuant to the real axis limits. The **MinMax** function is used here for finding the maximum and minimum values of the transmuted set. These values stand as arguments of the **Rescale** function.

```
ymin = 0.3; ymax = 1.125;
axisy = Rescale[delogdata, MinMax[delogdata], {ymin, ymax}][[1]];
```

At this point, the values for each axis are ready to be plotted. But to be able to plot using functions such as **ListPlot**, **ListLogPlot** and alike it is necessary to transform data to the form like $\{\{x_i, y_i\}\}$. It can be done via functions **Riffle** and **Partition**:

```
plotdata = Partition[Riffle[axisx, axisy], 2];
```

Considering that in this example the original data are in logarithmic scale of the y-axis, let us plot using the **ListLogPlot** function. It can have many arguments, but the most useful that we will utilize are as follows: **ImageSize** for changing the size of the image, **Joined** for joining the plot points, **GridLines** for activating the gridlines and **AxesLabel** for labeling the axes:

```
ListLogPlot[plotdata, ImageSize -> 500, Joined -> True, GridLines -> Automatic, AxesLabel -> {"f, GHz", "A, dB"}]
```

It is important to underscore the fact that to view the output, the semicolon "**;**" at the end of the line has to be absent. Also, sometimes when the amount of points is low there arises the need to "smooth" the plot, so that it does not look broken. This can be done by interpolation, using **InterpolationOrder** as an argument. For the most part its values are in range from 2 to 4. However, if the plot consists of a large amount of points, interpolation is not reasonable.

While taking the plot reading, it can be useful to get rid of the noise, which is an integral part of every measurement. Since usually the useful signal is modulated by high frequency noise, it is possible to do it away with low pass filter (LP filter) function. In addition, note that it is not necessary to feed data into the variable in order to plot. The next example shows how to plot the filtered data without using variables for them.

```
ListLogPlot[Partition[Riffle[axisx, LowpassFilter[axisy, 0.02]], 2], ImageSize -> 500, Joined -> True, GridLines -> Automatic, AxesLabel -> {"f, GHz", "A, dB"}]
```

In this example, the 0.02 filter value was chosen. Apart from the LP filter, Wolfram Mathematica has other functions for "smoothing" plots, which may appear more suitable for other cases. For instance, **GaussianFilter** and **MeanFilter** can be used. As for the example above the values 3 and 50 respectively should be recommended. The plots of the signal with the noise unfiltered and filtered by the LP filter are shown in Figure 2 a) and b) correspondingly.

a) b)

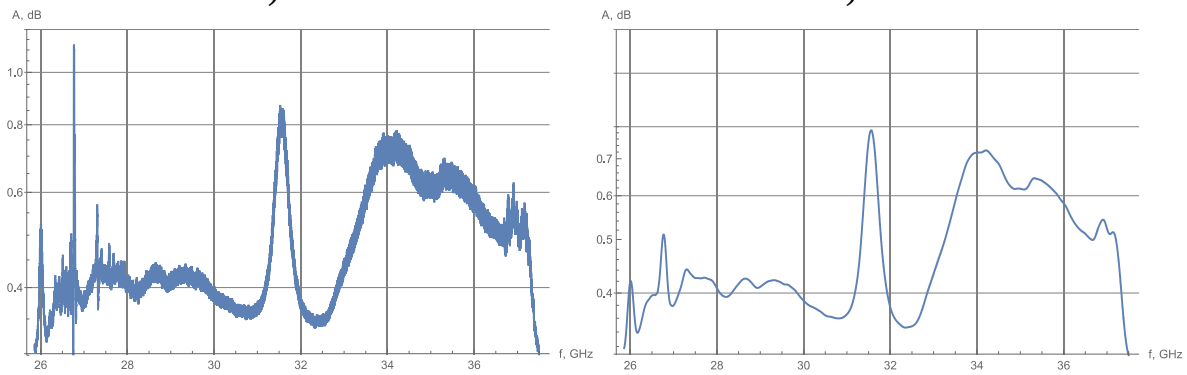


Figure 2. Obtained plots: a) no filtering, b) low-pass filtering

It should be emphasized, when the noise component is significant or causes signal bursts that are not useful, it makes sense to apply LP filter (or its analog) directly to the imported data:

```
data = LowpassFilter[Import["C:\\Directory\\file.wav", "Data"], 0.02]
```

Such method prevents the raise of errors while setting up axes scales.

When it is necessary to compare two or more plots, they can be put on the same coordinate grid. There are a few ways to do that, but we will consider the simplest one — by **Show** function. It can be done in two ways: by putting the corresponding commands into the arbitrary variables beforehand, or straightforwardly. The first method is more elegant, but let us consider both (the notation for **ListLogPlot** is shortened).

```
a = ListLogPlot[plotdata1];
b = ListLogPlot[plotdata2];
Show[{a, b}]
```

or

```
Show[{ListLogPlot[plotdata1],ListLogPlot[plotdata2]}]
```

While taking the readings from the plot it is convenient to use the ability of getting coordinates using mouse cursor. It can be done by right-clicking on the desired plot and choosing **Get Coordinates** menu entry. After that, the cruciate cursor and numerical values of axes will appear.

Another practical capability of dealing with plots is dynamic scaling. It can be implemented with **Manipulate** function. Without getting into details — they can be found in help documentation — let us consider the simplest example of the code, which gives us the two-axes scaling:

```
Manipulate[ListLogPlot[Partition[Riffle[axisx,axisy], 2], ImageSize -> 500, Joined -> True, GridLines -> Automatic, Frame -> False, AxesLabel -> {"f, GHz", "A, dB"}, PlotRange -> {{minx, maxx}, {miny, maxy}}], {{minx, xmin, "x-axis min"}, xmin, Mean[{xmin, xmax}]}, {{maxx, xmax, "x-axis max"}, Mean[{xmin, xmax}], xmax}, {{miny, ymin, "y-axis min"}, ymin, Mean[{ymin, ymax}]}, {{maxy, ymax, "y-axis max"}, Mean[{ymin, ymax}], ymax}]
```

The same functionality can also be carried out for combined plots. In order to do this, it is enough to put the argument **PlotRange** into the **ListPlot** function, e.g.:

```
Manipulate[Show[{ListLogPlot[plotdata1, (…), PlotRange -> {{minx, maxx}, {miny, maxy}}], ListLogPlot[plotdata1, (…)], {{minx, xmin, "x-axis min"}, (…)}]
```

In case of multiple measurements with the same device and also for convenience's sake, it is reasonable to take functional approach and roll up all considered operations in one function and use it for dynamic plotting afterwards. It provides the ability to use one short line-length command. However, this method faces strong system requirements. But this problem may be solved by using automatic parallelization function **Parallelize**. Let us consider it for our example:

```
Parallelize[quickplot[data_, xmin_, xmax_, ymin_, ymax_] :=
Manipulate[ListLogPlot[Partition[Riffle[Range[xmin, xmax, (xmax -
xmin)/Length[data[[1]]]],Rescale[20^Rescale[data],MinMax[20^Resca
le[data]], {ymin, ymax}][[1]]], 2], ImageSize -> 500, Joined ->
True, GridLines -> Automatic, Frame -> False, AxesLabel -> {"f,
GHz", "A, dB"}, PlotRange -> {{minx, maxx}, {miny, maxy}}],
{{minx, xmin, "x-axis min"}, xmin, Mean[{xmin, xmax}]}, {{maxx,
xmax, "x-axis max"}, Mean[{xmin, xmax}], xmax}, {{miny, ymin, "y-
axis min"}, ymin, Mean[{ymin, ymax}]}, {{maxy, ymax, "y-axis
max"}, Mean[{ymin, ymax}], ymax}]]
```

Here **quickplot** is a chosen name of the roll-up function (can be arbitrary), and its arguments **data_**, **xmin_**, **xmax_**, **ymin_**, **ymax_** are the original data set and axes limits accordingly. Let the original data set be in the new variable **newdata**. Then, the plot can be obtained as follows:

```
quickplot[newdata, 25.86, 37.5, 0.3, 1.125]
```

The result is shown in Figure 3. Also, the part of the plot was selected by slider controls.

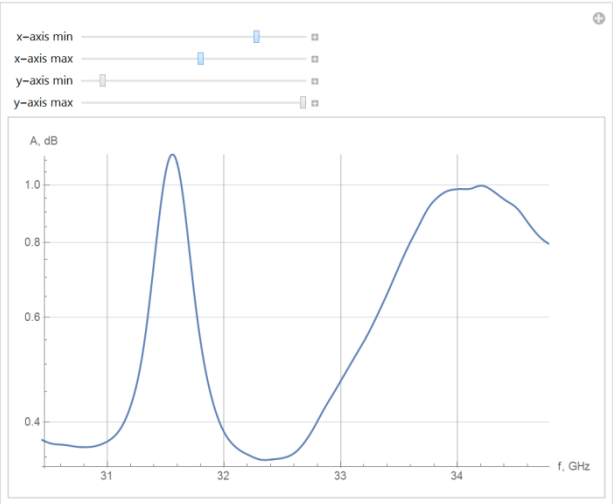


Figure 3. Resulted plot with dynamic scaling

To sum up, the convenient and functional way of digitized data processing was obtained. Moreover, it can be easily modified or corrected if necessary. It is worthy of note that such kind of flexible implementation is provided particularly by great capabilities of the Wolfram Mathematica computation program, which was used in the examples above.

UDC 004.38:004.41

V. Draichuk, Master student
A. Panishev, D.E., Prof., research advisor
V. Shadura, senior teacher, language advisor
Zhytomyr State Technological University

THE SIGNIFICANCE OF REACTIVE PROGRAMMING USE FOR THE DEVELOPMENT OF ANDROID OS APPLICATIONS

Android is one of the most relevant mobile operating system. This operating system was developed by Google and is based on Linux. The basic element of the operating system is the Dalvik virtual machine. It is necessary to recognize that the future of PC – is in a portable devices, tablets, e-books, netbooks and smartphones, and all these are Android based.

In May 2010, Google achieved 100 thousand activations per day. In December 2010, there were 300 thousand activations. In May, at the Google I/O conference announced the statistics, according to which about 400 thousand new devices on Android platform were activated every day. In July 2011, Andy Rubin (Andy Rubin), the Vice president of Google, who is responsible for the development of Android platform, announced the overcoming of new limits - 500,000 activations per day with increasing distribution of platform in the 4.4% per week. This statistics includes only information about the first registration of new devices.

In July, 2011, there were already sold more than 100 million Android-devices which had been developed by 36 professionals, their distributed networks reached 215 operators. The productivity of Google Play has overcome a mark of 200 thousand applications. The results of Google Play are the installation of about 4.5 billion of application copies. 84% of smartphones were sold in the third quarter of 2014, running on Android OS. Therefore, the application development for Android today is extremely important.

While working with Android one can often see how all the functional code in the methods is based in lifecycle activity/fragment. In fact, this approach has some reasons to exist - "lifecycle methods" are just the stages of system components and specially designed filling of their code. In addition, UI framework described by xml-files already gives us the basic separation of logics and interface. But it is offen difficult to use such approach effectively and this division is not always possible. It ultimately results in the developing all the codes in onCreate, which adversely affects the transparency of code and makes almost impossible its modification and support.

RxJava is a new technology that is now one of the hottest topics of discussion in the Android-programmers community. The reactive programming is a programming paradigm, based on data flow and distribution changes. This means that programming languages should be able to express static or dynamic data streams easily, and implement the execution model which will automatically send changes via data flow. Resilience, sensitivity, focus on events and scalability are the main

principles of reactive programming. If one follows them, it will make the work with code easier. Reactive programming is the development based on asynchronous data streams.It can seem not to be new. The typical mouse actions are asynchronous so it is nothing new about working with such kinds of actions. One can create data streams from all entities desired; by not just the mouse cursor and movements.The flow can inhance anything. These may be the variables, the information of the user types, the properties, data structures, etc. For example, the Twitter feed will emit a stream of data in the same way as the mouse actions such as movement or click. You can listen to the flow and react to it accordingly.

Study the programing features is important because the application of this technology makes it easier to develop code and handle errors. This technology provides the extended filter possibilities and helps to make processing results of methods calls easier.

Some perspectives of using RxJava in Android apps:

– Usage of RxJava simplifies the multithread RESTful API calls;
– Usage of RxAndroid optimizes the behavior of basic Android UI components;
– Simplified work with threads from the main application.

Using RxJava technology provides many benefits in developing and supporting apps, first of all the results of all transactions are always predictable. We know about all the errors and potential problem areas that may arise in the code develpoment and how to deal them.

The principle of sensitivity in action is as follows. The database connection or server is maintained due to the timeout, the call will attempt to recover an error. A caching executes the parallel processing result. The orientation related the events is based on the process of execution the request, we will always have the responce from events, successful or unsuccessful completion of the request, the event completion, etc. The code becomes easily expandable and requires obtain almost no changes. If we need to make a bug handling or maintaining the stack errors, that can be easily processed by components of RxJava.

The most appropriate cases to use RxJava are:

– UI actions as mouse movements, button clicks;
– The actions related WebSocket API;
– Events such as changing the features, registration procedure, and so on.

It is not recommended to use RxJava only to iterate collections, it is much better to use the regular iterators.

Rx is based on Observer template. The idea of Rx is in the absence of information about the sequence that is valuable or is over. But one is able to control over when starting and stoping taking values. The basic building blocks of code are reactive Observables and Observers. Observable is a source of data and Observer –is a user. Generation data through Observable always occurs at one and the same course of action: Observable gives a certain amount of data and exits - either successfully or

with error. Each Observers, signed on Observable, has a method called Subscriber.onNext() for each item of data flow, after which someone can be called Observer.onComplete() or Observer.onError(). This is very similar to the regular pattern of "observer", but there is one important distinction. Observables often begin to generate data before somebody is subscribed to them.

You can use operators over Observable, such as flatmap, filter, zip, merge, cast, etc. Operators can be used in between Observers and Observables for manipulations with data. In RxJava there are many operators, so it would be better to focus on some of them.

– Create is to create Observable create from nothing by calling observer methods;
– From is to convert any other object or data structure in Observable;
– Map is to transform the elements emitted by Observable by calling the application function to each element;
– Timer is to create Observable, which emits one element after the delay;
– Start is to create Observable, which emits the function;
– Filter is to select only those elements of Observable, which pass the predicate test;

Reactive applications are more resistant to the bugs and unexpected errors, usage of this technology makes the code clearer and more flexible. Many routine work can be translated into a library that gets the work done better than Android-base components. This allows focusing on the implementing the things that really should be developed.

Rx works perfectly with highloaded frontend apps. But the potential of the technology does not relate only the client side, it works great with the server side and databases. In fact, RxJava is a key component in server-side API of Netflix. Rx is not a framework, not limited to one specific type of application or language. This is actually a paradigm that can be used when developinging any event driven software.

UDC 621.317

V. Ivashchuk, Master student
Y. Podchashinskyy, Prof., Doctor of Engineering
V. Shadura Senior Lecturer, language advisor
Zhytomyr State Technological University

THE INVESTIGATION OF ALGORITHMIC COMPENSATION METHODS FOR GEOMETRIC CURVATURES OF AEROSPACE IMAGES IN THE AUTOMATED SYSTEMS OF THE EARTH'S SURFACE MONITORING

Taking images of large areas is performed with the methods of photogrammetry. It studies the means and the technology of determination the form, size, position in space, quantitative and qualitative characteristics of objects by their images. Images of area are taken by applying special equipment that is installed on the air planes or satellite carriers. Aerospace shooting is divided into a number of classes and types, depending on the purpose of a carrier, imaging equipment, technologies of shots and the form of the result presentation.

The aerospace shooting uses planes, superlight drones and helicopters. There are several types of aerospace shooting: aero photography, heat infrared, radiolocation and other. Besides, the traditional aero methods include so-called geo physic shooting. They are aeromagnetic, aeroradiometric, etc. These methods allow obtaining the digital information about the researched objects, but not the traditional images.

Space shooting, i.e. shooting from the height of more than 150 km, is performed from a satellite which moves on the set orbit. Therefore, its abilities are limited compared to those done by a plane. Any satellite has to be considered taking into account the parameters of its orbit. Such parameters as the form, the tilt, the height the position of its surface regarding the Sun are really important from the point of view of space shooting.

Camera vibrations or other equipment vibrations can often occur at aerospace shooting. It can cause the image trembling. Mostly, this trembling is the optical axis oscillations. In principle, there may be significant oscillations, reaching a half of a shoot frame, especially when taking an increased image. In addition, there can be more complex cases, for example, when the camera can not only vary, but change its orientation and position in space.

Therefore, the purpose of such oscillation compensation is to obtain the stable images. This task is divided into two sub-tasks.

Firstly, it is recommended to define the parameters of image deformation from shot to shot. The given article focuses on the class of linear deformation. Despite the relative simplicity of the deformation model, it allows describing the typical distortions such as shift, rotation and compression.

Secondly, it is recommended to convert the input shot to the previous coordinate system by the estimation of deformation parameters (deformation compensation). It is necessary to separate the regular deformations caused by deliberate camera movement, from the occasional noise disturbances and compensate only the last ones.

The main task of the algorithm development is to provide of two following conditions.

1. The algorithms have to work with a variety of resistant video sequences. This video sequence can be taken in difficult conditions and can have a very low quality.

2. Data processing algorithms have to provide video streams in real time by modern specialized computer tools.

The task of geometric distortion compensation is divided into two sub-tasks.

The first task is to determine the geometric deformations. Every shot has to obtain its geometric transformation related the previous one, assuming that the image shots are the same for the stationary background. The geometrical transformation implies affine transformation, i.e the transformation of the form:

$$\vec{r}(t+1) = A(t)\vec{r}(t) + \Delta\vec{r}(t), \qquad (1)$$

where $\vec{r}(t)$ - are the coordinates of the background in a shot,

$\vec{r}(t+1)$ - coordinates of the same point on the next scene,

$A(t)$ and $\Delta\vec{r}(t)$ - are geometric distortion parameters to be defined.

The deviations from this mathematical model were taken into account when developing and processing the algorithms:

- a fuzzy image with a low proportion signal - noise;
- the noise is not of Gaussian nature, it is non-stationary, correlated in time and space;
- the additional distortions are blurs, linear geometric distortions, nonlinear changes in brightness and color of a shot etc. ;
- scan distortions;
- the image transience.

Another sub-task is to separate the regular geometric distortion from noise.

It is recommended to compensate only noise component of the geometrical distortion in order to present the video sequence. The regular component (eg, translational displacement chamber) has to obtain the minimum changes. Therefore, the geometric distortions are the following function of time:

$$\begin{cases} \Delta\vec{r}(t) = \Delta\vec{r}_s(t) + \Delta\vec{r}_n(t) \\ A(t) = A_s(t) + A_n(t) \end{cases}, \qquad (2)$$

where $\Delta\vec{r}_s(t)$ and $A_s(t)$ - are the useful components of geometric distortion,

$\Delta\vec{r}_n(t)$ i $A_n(t)$ - are the noise components, which should be compensated.

This problem can not be solved without the initial information about the beneficial components of distortion. But this information is usually little and does not

solve the problem. Therefore, this article offers the empirical solutions that cover most of possible situations a.

The following formula is used to determine the conversion of a shot:

$$Q = \arg\min_{Q} X(\left\| F(t-1)_{ij} \right\|, \left\| T_q(F(t))_{ij} \right\|), \quad (3)$$

where Q - is the vector of conversion parameter, which may include both a shift in a shot personnel and the angle and zoom ratio or six affine coefficients,

X - is the function of dissimilarity,

$F(t)_{ij}$ - is a shot at time t,

T_q - is the converting of the shot with the set conversion parameter vector.

There are different methods of estimating the parameters of deformation of the shot, in particular, on the basis of optical flow inside it based on the selection of characteristic points of the image brightness or directly using the input image points.

The algorithmic geometric distortion compensation is usually performed by the reverse design of pixels of the corrected image.

The digital methods of restoring image can be applied to compensate defocus, astigmatism and blur of the image. In this case, it is recommended an attempt to restore an image that has been distorted by using the initial information about the cause of the image problem. That is why; the restoration methods are based on the modeling processes and application procedures for final reproduction of the original image, using such algorithms as the inverse filtering and Winner filtering.

The main purpose of this article is to develop the test algorithms for compensation the geometric distortions of images for their further application software imaging.

UDC 681.5

O. Kutin, Bachelor student
O. Dobrzhanskiy, PhD in Eng., As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

COMPARISON OF RELAY AND PID REGULATORY CONTROL PRINCIPLES

Most of modern developments and researches of engineers and scientific staff of the productions are conducted with controllers. Controllers are used to collect and process signals received from sensors subsequent adjustment of a certain parameter. Depending on the destination, each controller is configured to control one or more laws. The commonest control principles used nowadays are relay (positional) and PID control principles. Let's consider some information about these control principles

in different categories. Both control principles were tested on the same device (controller MT-48 production FOTEK).

Speed of response and delivery of results

The same temperature values were put into the controller and the time during which the regulating devices in both laws warm up to the predetermined temperature was compared. Time of the heating in the oven, running on the relay control law was less than during the work on the PID law. Time difference was about one and a half minutes at the expense of low-margin predetermined temperature and ambient temperature.

Accuracy

Overshoot time and value were researched for both control principles. In relay control principle this characteristics were less than in PID principle. It means that relay control principle less accurate than PID principle. The reason is one feature of relay principle. In this principle we have only two control points. They are maximal and minimal values of controlled function or physical quantity. When, for example, temperature in the oven becomes lower than the minimal value programmed in the controller, the controller gives a command to turn on a heating element. When the temperature becomes higher than maximal value, the command is to turn off. But we cannot control values of the characteristics when they are between maximal and minimal. This is the reason of higher speed of response and lower time of overshoot. In PID law we cannot get rid of overshoot, because at every moment of time the characteristic value is collected and compared with the input value. Depending on the difference between the checked and input characteristic values the time of turning on of the heating element will change with linear law.

Conclusion

Taking into consideration all above mentioned we can state that the choice of the control principle depends on the type of the task. If you need quick results and needn't control your process every moment with high accuracy you would better choose the relay control principle, on the contrary – PID law will be your best choice.

UDC 612.914

K. Skok, master student
S. Yaremchuk, PhD in Physics and Mathematics, Prof. research advisor
V. Shadura, language advisor
Zhytomyr State Technological University

P-ALGORITHM METHOD MODIFICATION

There often occurs a task to place the sources of physical field on the fixed seats. Such problems are common at production (the optimal placement of pollution sources, sound, etc.), at radio engineering apparatus design (the provision of circuit optimal temperature mode), at searching the optimal placement of oil wells and so on.

The task formulation.

There is an area $\Omega \subset R^n$; with N sources of physical fields $D_i, i \in 1:N$; N seats $n^j \in \Omega, j \in 1:\mathrm{N}$ and K of control points. It is needed to place the sources of physical field on the fixed seats in such a way to obtain the maximum field value from the field at the control points and to make it become minimum one. Every source should occupy one seat only and one source has to be available for one seat.

The physical field which is created by the placed sources and the boundary conditions on the area Ω is described with the task of mathematical physics.

The mathematical model of the task.

The controlled variables.

$$x_{ij} = \begin{cases} 0, \textit{ if the } i-\textit{source is not available for } j-\textit{seat} \\ 1, \textit{ if the } i-\textit{source is available for } j-\textit{seat} \end{cases}$$

The limitations.

$$\begin{cases} \sum_{i=1}^{N} x_{ij} = 1, j \in 1:\mathrm{N}, \\ \sum_{j=1}^{N} x_{ij} = 1, i \in 1:\mathrm{N}, \end{cases} \quad (1)$$

$$x_{ij} \in 0,1, i \in 1:\mathrm{N}, j \in 1:\mathrm{N}, \quad (2)$$

The purpose of the function.

$$f(x) = \max_{k \in 1:K} f_k(x) \to \min, \quad (3)$$

where $f_k(x) = \sum_{i=1}^{N}\sum_{j=1}^{N} c_{ij}^k x_{ij}$, c_{ij}^k – is the role of *j*- source, which is placed on the *j*-seat of the field value at *k* control point.

Computation scheme of P-algorithm metod.

1. The initial basis $\bar{x}_0^0$ is selected. The point corresponds to x^0. $s = 0, r = 0$.
2. Suppose there is the basis $\bar{x}_s^r$. It The point corresponds to it x^r, then:
   2.1. The multiplicity is created:
   $K_{\max}(x^r) = \{k \in 1:K \mid f_k(x^r) = f(x^r)\}$.
   The potentials $u_i^k(\bar{x}_s^r), v_j^k(\bar{x}_s^r)$ and evaluation $\Delta_{ij}^k(\bar{x}_s^r)$ are found $\forall k \in 1:\mathrm{K}$ for $\bar{x}_s^r$.
   2.2. If there is no positive evaluation for at least one $k \in K_{\max}(x^r)$, then $x^* = x^r$ is the task minimum problem. It is the end of the algorithm. Otherwise, move to 2.3.
   2.3. The multiplicity of cells $I(\bar{x}_s^r)$ is found. Every element of the multiplicity satisfies the following conditions:
   $\forall k^* \in K_{\max}(x^r)$ *implemented* $\Delta_{i^* j^*}^{k^*}(\bar{x}_s^r) > 0$.

If it is empty, then go to 4. Otherwise, move to 2.4.

2.4. The multiplicity $I\ \bar{x}_s^r$ provides the selection of the element that satisfies the following condition $f_k\ x^r\ -\Delta_{i^* j^*}^k\ \bar{x}_s^r\ < f\ x^r\ , \forall k \notin K_{\max}$. If there is no such element, then go to 4. If there are several elements, then it is recommended to select the one that creates a single traffic. Let us denote it via i^*, j^* .

2.5. The next basis is found.

3. If the traffic value is equal to one, then there is a new point x^{r+1}. It corresponds to a basis $\bar{x}_0^{r+1}$. r is increased by 1 and s obtains the value of zero. Otherwise, there is the same point x^r, but another basis $\bar{x}_{s+1}^r$. r is not changed and s is increased by 1. Then move to 2.
4. $x^* = x^r$ is the solution. x^* is the stationary point of the method.

The disadvantage of this method is that its efficiency significantly decreases with increasing number of control points. Therefore, the modified P-algorithm is developed. It possesses the optimized procedure of a cycle design and is based on the method of potentials, which uses tree structures [1].

To improve the method it is recommended to use the parallel computing in software implementation. The evaluation and the potentials are computed in parallel at every step of the algorithm.

REFERENCES

1. Шарифов Ф.А. Об эффективности алгоритмов решения сетевых задач на древовидных структурах / Ф.А. Шарифов // Кибернетика и системный анализ. –2003. –№3. –С.179-184.
2. Алгоритм решения дискретной минимаксной задачи размещения источников физического поля / С.И. Яремчук, Р.В. Бурда, С.С. Матущенко // Кибернетика и системный анализ. — 2009. — № 5. — С. 153-163. — Бібліогр.: 8 назв. — рос.

UDC 681.5.03

A. Susik, Master student
I. Cherepanska, Ph.D., Associate Professor, research advisor
V. Shadura, Senior Lecturer, language advisor
Zhytomyr State Technological University

MANAGEMENT QUALITY AUTOMATION IN FMS

To provide the quality of products is one of the main problems at modern flexible manufacture, for example, the mechanic processing production. The set quality indicators are conditioned by such factors as the product quality, the quality of work and service, the requirements of high level and tough competition.

The classic interpretation of quality management implies forming special approaches to the management of an organization or enterprise. These approaches are focused on the product quality and are based on the participation of all employees in the activities targeted to achieve success. It can be done by satisfying the customers' demands, getting profit by the enterprise and providing society with the benefit.

The quality is a complex notion according to the standard ISO 9001. It combines a set of different product properties. These properties condition the product intended usage and quality management at the stage of production. Taking into account all the mentioned above, the quality management can be considered as a process directed to achieve the set quality indicators, e.g., reliability, workability, safety and others. It takes place at performing some technological operations. Making technical decision is also of great significance. This decision is made to detect the causes which lead to the quality indexes deviation from the set ones and to correct them. The automation of this process can be considered as making such decision. (Fig. 1).

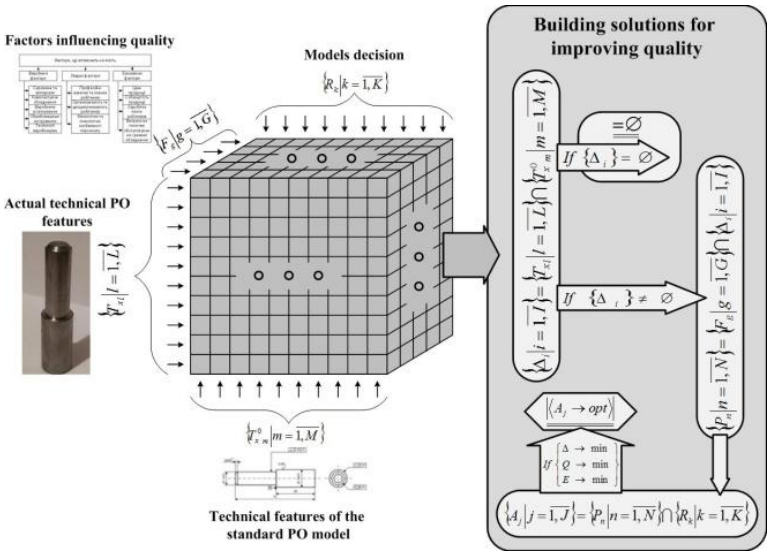


Fig.1. The graphical interpretation of quality management at the stage of production

It is easy to see, that the set quality indicators of the production object (PO) can be provided at the stage of production in mechanic processing FMS with reliability, workability and safety. It is recommended to influence such technical features of PO as placement deviations, the deviations from rectilinear position and cylindricity, longitude section profile deviation, the deviations from roundness, roughness deviations and strength properties.

The comparison of the multiplicity of set technical features of the standard PO model to the multiplicity of the actual technical PO features has to be performed at the process of the automated control of the quality decision making. If there is no correspondence of the actual PO technical features with the set ones, it is possible to create the possible deviation multiplicity of technical features, which can cause the PO quality decrease.

$$\Delta_i \; i = 1, I \;\; = \;\; T_{x_l} \; l = 1, L \;\; \cap \;\; T^0_{x\,m} \; m = 1, M \qquad (1)$$

If there is a deviation, the quality decrease in whole takes place and it is important to detect the factors which have caused this. In such case the possible causes have to be analyzed. Therefore, the comparison of the deviation multiplicity to the factors of influence multiplicity is recommended:

$$P_n \; n = 1, N \;\; = \;\; \begin{matrix} \Delta_i \; i = 1, I \;\; \cap \;\; F_g \; g = 1, G \;\; ,якщо \;\; \Delta_i \;\; \neq \emptyset \\ 0, якщо \;\; \Delta_i \;\; = \emptyset \end{matrix} \qquad (2)$$

The PO quality decision-making implies finding the multiplicity of separate solutions which influence PO quality much and are recommended to implement:

$$A_j \; j = 1, J \;\; = \;\; P_n \; n = 1, N \;\; \cap \;\; R_k \; k = 1, K \qquad (3)$$

The final decision making can be implemented as ranging of the solution multiplicity, if the optimality conditions are the same as in (3):

$$A_j \rightarrow opt \;\; \begin{matrix} \Delta \rightarrow min \\ ,якщо \;\; Q \rightarrow max \\ E \rightarrow min \end{matrix} \qquad (4)$$

where: Δ - is the deviation of real technical PO feature values; Q - is the efficiency of PO production; E - are the financial and economic costs related to the elimination of the causes leading to the quality decrease.

The decision support system (DSS) is recommended for the practical implementation. It is a complex of interactive modules and the corresponding quality management stages (Fig.2) are distributed among them. The interaction of the modules is performed on the basis of the production rules and DSS functioning is done by using QFD methodology. It is a flexible method of decision making which allows performing the grounded PO quality control and is used by the authors at the stage of the determination the significance of the PO technical features.

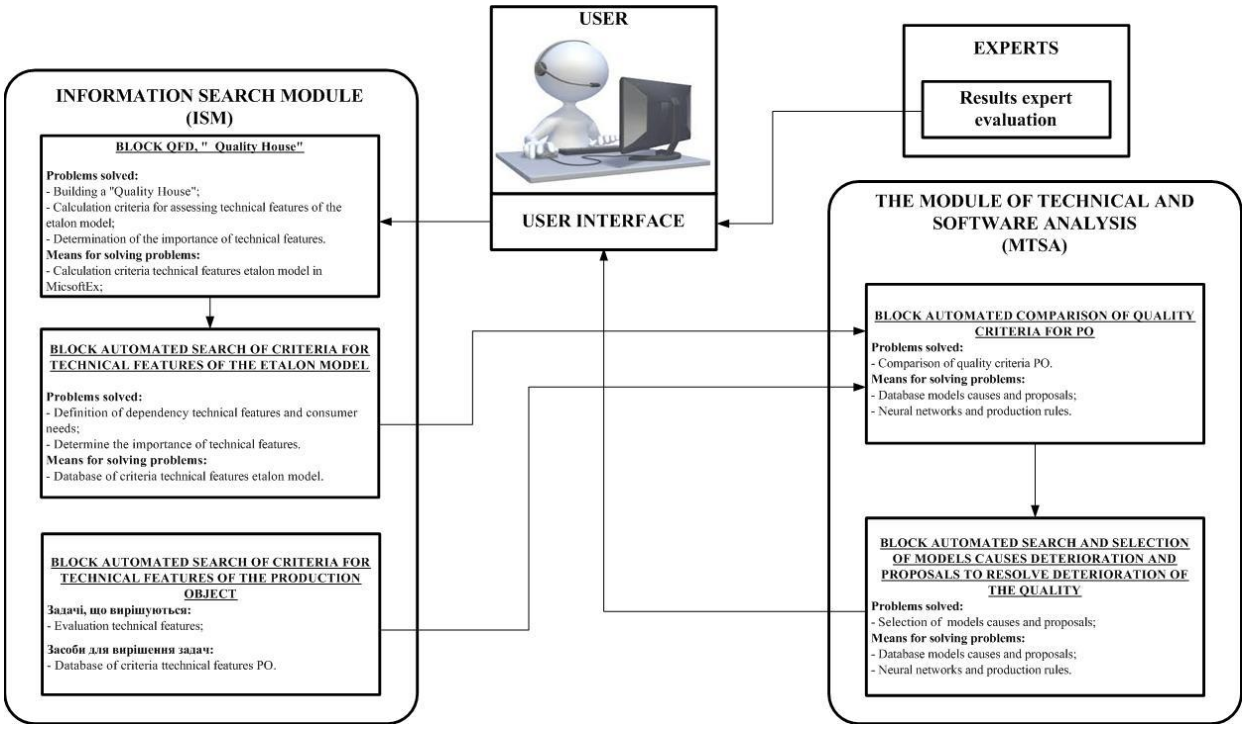


Fig. 2. The DSS structure for the automation of PO quality control at the stage of production.

DSS consists of the information search module (ISM) , the module of technical and software analysis (MTSA) and the user interface. The operations are executed in the modules as in the expressions (1) – (4). The MTSA consists of the indicator comparison unit, the determination of deviations of the production objects quality, the unit of search and selection the models of the causes of the quality decrease and the propositions as to the improvements to solve the task of comparison of PO quality criteria by the expressions (1), (2) and to find the models of causes and propositions by the expressions (3), (4).

Thus, the DSS is designed as an interactive automated system or software complex used to assist and support decisions of the quality control at the stage of production. It provides the grounded and objective analysis of the PO technical features which influence the quality indicators and shows the ways to improve them in complex production conditions.

REFERENCES

1. Пономарев С.В., Мищенко С.В., Белобрагин В.Я. Управление качеством продукции: Введение в системы менеджмента качества. М.: Стандарты и качество, 2004ю – 244 с.

2. Rampersad H.K. Total Quality Management: An Executive Guide to Continuous Improvement. BerlinHeidelberg: Springer Verlag, 2001. – 190 p.

3. Hauser, J. R., Clausing. D. The House of Quality // Harvard Business Review. – Boston, 1988. – Vol. 66. – № 3.

Session work №3

CURRENT RESEARCH IN THE FIELD OF ECONOMICS

UDC 612.914

D. Bazyliuk, Master student
O. Yushkevych, PhD in Econ., research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

MECHANISM OF STIMULATING WORKERS OF TRANSPORT COMPANIES

Transport sector of Ukraine is facing changes which require its deep democratization and humanization and thus satisfying real need of regions in specialists of transport profile. In conditions of economic instability moral incentives are becoming more important. It is necessary to search an effective mechanism to stimulate employees. The mechanism should aim at increasing of productivity, improving of work quality and providing an accelerated economic development.

The goal for the development of transport companies is theoretical foundation and development of practical recommendations for the effective functioning of the main elements of the economic mechanism for stimulating workers of transport companies. To achieve this goal it is necessary to solve the following problems:

- to summarize native and foreign experience in the evaluation of employees activity at transport companies and their tangible and intangible incentives;
- to analyze and clarify the economic content of the terms "employee activity evaluation", "motif", "motivation for work" and "work incentives";
- to improve the elements of the mechanism for stimulating workers activity and develop the recommendations for creation of effective payment system and socialization of labor;
- to offer basic approaches to the management of needs and interests of transport companies workers based on content (identification of needs, reward or punishment) and procedural (agreement of an employee’s efforts and wages) theories of motivation;
- to improve the system of financial responsibility of transport companies workers.

Thus, the mechanism of work stimulation should be regarded as a system of economic methods of encouraging people to be included in the workflow. For successful implementation of work stimulation system it is necessary to link tangible and intangible incentives with certain needs of each member of the staff.

UDC 612.914

K. Dorozhkina, Master student
V. Tkachuk, Doctor of Economy, Prof., research advisor
G. Khant, PhD in Phil., As. Prof., language advisor
Zhytomyr National Agroecological University

STRATEGIC DIRECTIONS OF INCREASE IN EFFICIENCY OF ALC ZhL

Under conditions of market relations development, when the resources provision of each market subject depends on the efficiency of economy, the increase of economic effectiveness becomes a primary task. Thus, it is necessary to develop various strategic directions aimed at increasing the efficiency of an enterprise.

Concerning the production aspect we suggest implementing the following:

- product quality improvement – under present-day conditions the product quality becomes the main factor of successful sales. Its increase is a very complicated process that requires additional costs, but nonproductive costs economy will contribute to the successful implementation of this measure, it will result in an increase of the sales volume and as a consequence the profitability of enterprises;
- expansion of the product range – it will open new trade areas, both native and foreign;
- purchase of new equipment – it will increase productivity and reduce labor costs;
- increase of the environmental friendliness degree of products – it will increase the products credibility of an enterprise under present-day conditions;
- increase of production volumes – it will enhance the profitability of a company.

The efficient marketing policy should include the expansion of foreign markets, thus enabling to sell additional products. Secondly, it's necessary to improve the advertising policy of a company (commercials on radio, television and in social networks). Rebranding or redesign may be implemented to attract new customers. The increase of the company's stores number will help to keep the product price on a hand level.

Effective management measures may include staff training: improvement of the organizational management structure: introduction of the system of operational accounting costs, thus providing an opportunity to adjust all the costs and efficient resource use and consequently directly manipulate company's profit; use of modern

automated tools to analyze both profit and profitability.

As regards the financial sector it's advisable to take the following measures as the economical use of available financial resources, the reduction of all types of stocks to achieve the most rapid promotion of products from a producer to a consumer; investor involvement, domestic as well as foreign, to increase production volumes and thus to improve the profit; bringing, if necessary, of additional financial resources.

The above mentioned strategic directions are graphically presented in table 1.

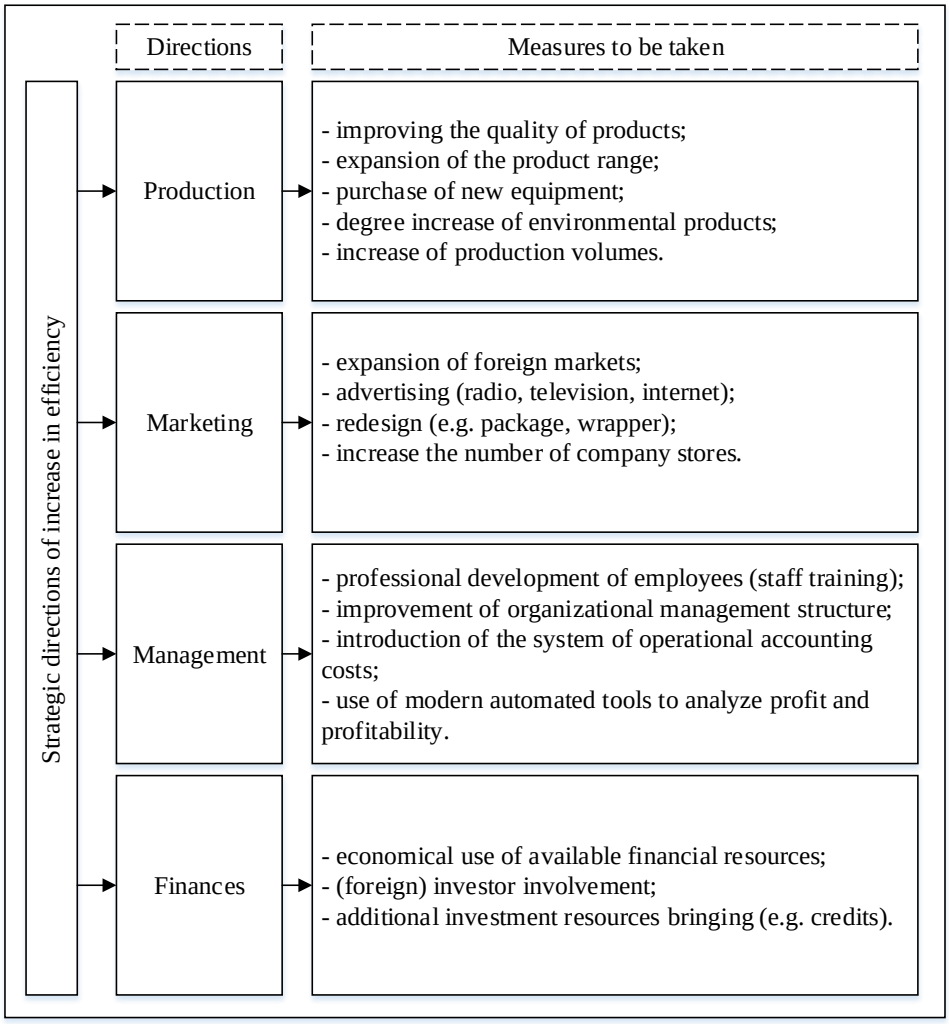


Table 1. Strategic direction of increase in efficiency of ALC ZhL

The implementation of the proposed measures is sure to enable the increase of efficiency of an enterprise under present-day conditions.

REFERENCES

1. Андрійчук В. Г. Економіка підприємств агропромислового комплексу: підручник / В. Г. Андрійчук. – К. : КНЕУ, 2013. – 779 с.

2. Костенко Т. Д. Економічний аналіз і діагностика стану сучасного підприємства : навч. посібник / Т. Д. Костенко, Є. О. Підгора, В. С. Рижиков. – К. : ЦНЛ, 2005. – 400 с.

3. Сілакова Г. В. Джерела інвестиційної діяльності та формування їх структури на підприємствах кондитерської промисловості : автореф. дис. канд. екон. наук: 08.00.04 / Г. В. Сілакова. – К. : НУХТ, 2009. – 20 с.
4. Сіменко І. В. Аналіз господарської діяльності: навч. посібник / за заг. ред. І. В. Сіменко, Т. Д. Косової. – К. : ЦУЛ, 2013. – 384 с.

UDC 330.341.1:658.659

A. Dyachuk, postgraduate
N. Kushnir, PhD in Econ., Prof., research advisor
V. Solodkyy, PhD in Econ., As. Prof., language advisor
National University of Water and Environmental Engineering

FOREIGN EXPERIENCE OF CROSS-BORDER INDUSTRIAL PARKS CREATION

Modern trends in the global economy reflect the ongoing transformation of the finance, resources and services market. The concept of borders and nationality of capital is becoming increasingly blurred. Optimal income and expenses correlation as well as potential risks taking into account are the determining factors of the investor's decision. The analysis shows that to maximize the economic outlook, developed countries use special economic areas and their derivatives – industrial parks (IP). This formed a cluster of the projects that have received the status of cross-border or border industrial parks (CIP).

In Ukraine, talks about creating of a network of industrial parks started in 2006, in 2012 the Law "On the industrial parks" was enacted. It is this form of production, experts say, that could be the engine of the Ukrainian economy, but so far there is not a lot of successes, however [1]. Analyzing the research of domestic scientists, such as K.Rudyy, O.Salihova, V.Hoblyk, O.Yehorova et al., it can be stated that the CIP now have greater opportunities for rapid implementation of their goals as compared to conventional industrial zones. The purpose of the study is functioning analysis of the existing CIP of neighboring states and substantiation of recommendations for the implementation of such economic models in our country.

Unlike the usual type of industrial park, cross-border park differs by the patterns of development. It is a single defined space with specially prepared industrial sites within border territories of two or more countries, where special regime of economic activity for economic entities for the purpose of meeting regional and national objectives is introduced. Special regime of economic activities within the CIP provides for use of national law of the entity placement country for implementation of economic activity and the ability to use the advantages of national legislations in the course of the promotion of finished products to consumers of participating countries [2]. The basis of the formation of similar projects in developed

countries is the reduction of transaction costs for the launch and implementation of investment ideas, which in their turn give innovative impetus to economy in the border areas. As an example, it is reasonable to study the experience of creation and functioning of Szentgotthard industrial park between Hungary and Austria, as well as cross-border industrial park "Gmünd – Czech Velenice", located on the border between Austria and the Czech Republic. They played an important role in the time when Hungary and the Czech Republic were not EU members. The formation and operation of these parks took place against the background of the project "Destruction of borders in the mind" a key place in which was given to nine techno parks: Dobersberh, Drozendorf, Retts, Hohenau, Bruck am Lyayta, Gmünd, Litshau, Laa and Weitra. Their introduction has made it possible to deepen the development of existing economic, social and cultural links within Austrian-Hungarian and Austrian-Czech cross-border regions [3].

The analysis of the functioning of the project Szentgotthard-Heylihen Krause (Hungary/Austria) shows that since its launch in 1997 there are more than 20 investors here, such as Opel Hungary or Lenzing Lyocell GmbH Co KG. While on the territory of Austria there are mainly medium or multinational companies, in Hungary – mainly representatives of small and medium businesses, often continuing of doing specific for this area works. Creating of CIP happened after the opening of the border checkpoint on the territory of the park in 2002. In 2004 the Szentgotthard logistics center was created. Investors in cross-border industrial park are attracted by reasonable price of land and local resources purchase; sources of maintaining business, including EU funds, placing the region, skilled workforce etc. Important factors are the existing technical infrastructure and services of business park. Potential investors are assisted in the development of project management, planning, during the implementation of project, creation of company, attracting of workers, preparation of necessary legal documents regarding permission for activities. Also the support in the case of entrepreneur’s application on the need of venture capital loan obtaining is provided [4, p. 267].

The functioning of the above mentioned cross-border industrial park "Gmünd – Czech Velenice" began in 1994, its total area is 83 hectares (33 hectares in Austria and 50 hectares in the Czech Republic), concentrated on the development of economic cooperation of Austrian and Czech companies by combining the advantages of relatively cheap Czech labor power and authority of the Austrian product quality. Financing of CIP was organized by two countries together, each side provided the construction of the necessary facilities and engineering services in its territory. In addition, land on both sides of the border for the project was allocated free of charge. Total investment in the project amounted to about 150 million Euros; 800 jobs were created. More than 30 companies operating mainly in the field of automotive, telecommunications and programming were attracted. In addition to the investment effect it created the opportunities to resolve the social issues and improve the attractiveness of the region.

Taking into account the experience of the implementation of CIP by the Eastern European countries, certain their aspects can be applied in Ukraine. For CIP in regions (Zakarpattya, Chernivtsi, Lviv) which border the EU countries, priority are the investments in production through transfer of technology and equipment for achieving high economic growth based on innovation. In this case the basic criteria for such projects include the localization of manufacturing industries in areas close to the raw materials and labor, reduction of logistics costs and costs of infrastructure operation, optimization of tax and customs duties. The convenient location, organizational and legal conditions should encourage participants of the park to implement within its borders investment projects related to the development of the territory, followed by the right of purchase. To the industrial parks it necessary to attract on the one side the large Ukrainian companies (from industrial regions) as well as Chinese, Japanese and Korean ones. On the other side of the border it is necessary to attract large companies-manufacturers or traders from Western Europe (especially as customers). In fact, the creation of cross-border industrial zones or parks has two goals. Firstly, create a structure in underdeveloped, remote regions which would have played the role of business incubator and helped investors to start production. Secondly, this coordinating structure would be a financial intermediary in obtaining financial aid from EU structural funds for further development of CIP [5, p.16].

It should also be noted that the main object of CIP, which are created by the host party on each side of the border, are well-developed logistics and communication system.

CONCLUSIONS. Cross-border industrial parks are designed to solve the problems of investment, technological, regional and social development of member countries. In the cross-border industrial parks to be set up on the border with Poland, Romania, Slovakia, Hungary potential of the region (minerals, energy, human resources, logistics) should be used at maximum level. The industrial parks should be established with the participation of Hungarian and Slovakian capital in cooperation with the machine-building corporations from other EU countries The implementation of border and customs control on the territory of cross-border industrial park, provides quick access when crossing the Schengen zone, which in the present conditions gives a comprehensive advantage for creating a product on both sides of the border. This allows to divide the risks from work for all project participants. This factor should be taken into account by local authorities on each side while making regulatory decisions.

On the other hand, it should be noted, that the potential decrease in the efficiency of industrial parks in the border areas of our country may be caused by low financial capacity of local governments and insufficient powers. Thus, the effective operation and development prospects of cross-border industrial parks depend largely on the efforts of parties on both sides as well as on their ability to unite in to cross-border innovation and production networks, thus generating potential for the future development of cross-border clusters.

REFERENCES

1.«Всі “за” і “проти” індустріальних парків в Україні» [Електронний ресурс]. – Режим доступу : http://regionews.ua/publication/144673.

2. «Транскордонні індустріальні парки: зарубіжний досвід і перспективи створення в Україні» [Електронний ресурс]. – Режим доступу : http://www.vestnikdnu.com.ua/archive/201481/120.html.

3. «Транскордонні промислові парки в економічному розвитку регіону» [Електронний ресурс]. – Режим доступу: http:// dspace.uzhnu.edu.ua/jspui/bitstream/lib/2031 / .pdf.

4. Державне управління регіональним розвитком України: монографія / за заг. ред. В. Є. Воротіна, Я. А. Жаліла. – К. : НІСД, 2010. – 288 с.

5. Розвиток транскордонного співробітництва: науково-аналітична доповідь; за ред. В.С. Кравців. – Львів, 2015. – 52 с.

UDC 612.914

O. Hlovatska, Master student
O. Yushkevych, PhD in Econ., research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

THEORETICAL ASPECTS OF FORMATION AND DEVELOPMENT OF ENTERPRISES PRODUCTION CAPACITY IN UKRAINE

In modern market relations the study of basic theoretical aspects of the formation and development of production potential is of great importance. The elements of production capacity in general can be considered as all the resources associated with the operation and development of the company. The effective functioning of economic entities is possible due to qualitative development of logistical, structural and functional, social and labor and other elements of the capacity, which in turn will ensure their competitiveness.

The most attention to this popular subject was paid by such foreign and native economists as S.Ishchuk, P.Fomin, M.Starovoitova, A.Oleksjuk, S.Gerasymchuk and others. Capacity is considered as potential opportunity for the company to produce material goods to meet the needs of people. Formation of the enterprise potential is a process of continuous recovery of all its components. There are the following types of production capacity formation:

1) simple formation of the enterprise potential occurs in constant volumes to restore consumed factors of production and to ensure the continuity of its operations;

2) extended formation of the enterprise potential presupposes quantitative and qualitative development of production factors and other potential components that provide higher efficiency of its operations.

Within extended formation we can distinguish three types of the enterprise capacity development:

1) extensive (traditional), where the increasing scale of production is achieved by attracting additional labor, natural resources and means of production and the preservation of formed technical and technological base;

2) intensive (innovative), when the capacity development is achieved through qualitative improvement of the factors of production: the use of advanced tools and objects of labor and energy resources, training technological management, and continuous improvement in the use of all available components of the enterprise potential;

3) extensive-intensive (mixed). As for the mixed type of extended capacity building, it is characterized by the balance or the dominance of one of the two factors of development. Therefore we can distinguish predominantly extensive, predominantly intensive or mixed type of the economic development.

The elements of the production potential of the enterprise can be considered as resources in some way related to the functioning of the company. The main problem in the research of the production capacity of enterprises of Ukraine is that all of its elements operate simultaneously and collectively. In other words the production potential is a complex and dynamic system.

The rapid development of production potential is caused by the influence of such factors as innovation, market conditions of production, etc. These impact factors cause certain changes in the production capacity, as well as changing of its technical and economic parameters.

Thus, the formation and development of production potential should occur in the following key areas:

1) selection of new methods and forms of economic activity according to the market conditions of the economy;

2) monitoring of the production potential in order to assess efficiency of its use and identify priority areas of its formation;

3) optimization of the structure of the economy through the use of existing capacity.

UDC 657. 286

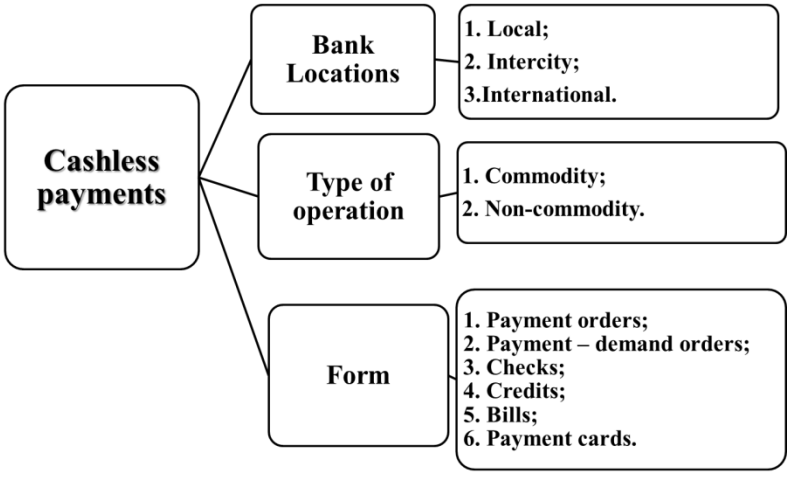
N. Kovalchuk, bachelor student
I. Zhigley, D. Ec., Prof., research advisor
N. Krushynska, language advisor
Zhytomyr State Technological University

CASHLESS PAYMENTS AS A RESULT OF MODERN TECHNOLOGIES

The problem of cashless payments is very important nowadays, because due to development of market economy and modern technologies, banking system and internet possibilities, payment system in the countries began to develop and it is still changing.

As a result, the clearing system is changing the all the time.

The following classification of non-cash payments is shown in Picture 1



Picture 1. Classification of cashless payments

Nowadays every company has a bank account through which the arrangements with customers, suppliers, employees, government are conducted, since payment by bank transfer simplifies, accelerates payments versus cash payments that have receded into the background as they are time-consuming and require the filling of a large number of documents and facilitate the implementation of fraud, concealment of cash flow.

It is much easier to complete the payment form, submit it to the bank during the day and these funds will be transferred for other purposes.

However, this system is also not perfect and has advantages and disadvantages, which are shown in Table 1

Table 1. Advantages and disadvantages of the use in non-cash payments [1].

Advantages	**Shortcomings**
Continuous turnover	Difficult procedure of control after turnover of cashless money
Reduced labour costs associated with the use of money	Possibility of machinations, swindles and appropriations of money from the accounts of enterprises
The speed payment realization	Imperfect payment systems
Effective use of temporarily free funds (deposits)	Not guarantees for timely payments
The simplicity in calculations, reducing document circulation	Limitations in terms of payments

The study of the subject “Accounting and Cashless Payments” was conducted by native and foreign scientists as M. Beluga, J. Blank, F. Butynets, C. Goals, B.Horelkin, V. Zavgorodniy, A. Kuzminskiy, A. Mazaraki , E. Mnich, V.Sopko, J.Blake, F. Wood, E.Brihhem and others. In their research they analyzed and revealed the problems and methods of accounting, analysis and control operations using cashless payments as a method of calculation between companies of different industries, but almost everyone of scientists has concluded that the system is necessary but not perfect [2].

In Ukraine the normative law organization of cashless payments is determined and regulated by a number of laws regulating banking activities, in particular the Law of Ukraine "About banks and banking activity" and the Law of Ukraine "About the National Bank of Ukraine."

As for the organization of settlements, they are governed by the regulations in non-cash payments in Ukraine in the national currency according to which non-cash payments are the transfer of certain amount of money from the accounts of payers on the accounts of recipients of money, and also enumeration of banks on the instructions of enterprises and physical persons [4].

These payments are made by the bank on the basis of settlement documents on paper form or in electronic form. Modern market economy is using such methods of cashless payments (Table. 2).

Table 2. Methods of cashless payments[3].

The method of cashless payments	*Characteristics payment document*	*Application of the calculations*	*Admission to the performance*
1	**2**	**3**	**4**
Payment orders	The document is the written instructions of the customer's bank that it serves, to transfer a certain amount of money from its account	For commodity payments and subsistence nature	During 10 calendar days
The	Combined billing document consisting of two	For commodity	During 20 days

Payment - required assignments	parts: 1) upper - the supplier benefits directly to the buyer (payer) to pay the price of the contract products (works, services); 2) lower - orders payer to transfer the amount from his account to the vendor.	payments and subsistence nature	from the date of issue. Day completing the requirements of instruction is not included
1	**2**	**3**	**4**
Checks	The document containing the written order of the owner account (issuer) the establishment of the bank (the issuing bank), which is written off the chekholder listed in the check sum of money	For commodity payments and long-distance nature	During 10 days of its completion, without including the day of filling
Letters of Credit	The form of payment, in which the issuing bank on behalf of the client (the credit applicant) must: - make payment to a third party (beneficiary) for goods, works and services rendered; - authorize other (nominated) bank to make this payment.	For commodity payments and subsistence nature	The validity for 15 days
Bill	Unconditional bond, in which one person must pay another prescribed amount within the prescribed period, the legal status is governed by the laws of the circulation of bills.	For commodity payments and subsistence nature	At the time of bill presentation

However, with the development of IT technologies, the established modes of payment recede into the background, replaced by which electronic payment system came when the company can pay using Internet - banking and payment cards that help instant payment. The second in popularity is the use of the payment order.

Examples of electronic payments are:

1. The client's bank

2. Internet - Bank Privat24 for business.

• «Client-Bank" refers to software and hardware systems, which allow the company to manage your account from a computer installed in the office of the company.

• Internet - Bank Privat24 for business enterprise owner provides anytime access to account details. Even on weekends and holidays.

Thus the development of cashless payments current, constantly evolving and changing, but the main problem is that the development of information technologies has no time for banking and organization of accounting in it. Since a large proportion of businesses still have outdated software, making forced to payments in cash.

Also important is the impact of the political and economic situation in Ukraine which is being developed at the moment which hinders the development of the banking system and leads to the threat of fraud and scams.

REFERENCES

1. Бухгалтерський фінансовий облік: підручник для студентів спеціальності „Облік і аудит" вищих навчальних закладів. /За редакцією проф. .Ф.Ф. Бутинця – 8-ме вид., доп. і перероб. – Житомир: ПП Рута, 2009. – 912 с

2. Піхняк Т.А., ЕКОНОМІЧНА СУТНІСТЬ БЕЗГОТІВКОВИХ РОЗРАХУНКІВ «Young Scientist» .- No 6 (09) .- June, 2014

3. Фінанси підприємств:навч. посіб. /Н. Б. Ярошевич. – К.: Знання,2012. – 341 с.

4. http://zakon.nau.ua/doc/?uid=1078.1284.0

UDC 336.201.2

D. Kravchenko, Master student
G. Tarasyuk, D. Ec., Prof., research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

PROVIDING SOLVENCY OF COMPANIES

Under the impact of economic and financial crisis, in conditions of political instability the rates of production volumes become significantly lower. The companies activity decline. Investment processes slow down or cease. Therefore, the necessary condition for further functioning of companies is maintenance of their solvency to ensure effective execution of their liabilities within the set deadlines [3].

The problem of solvency dedicated work of both domestic and foreign prominent scholars: M.F. Bertonesha, I. A. Blanca, V. A. Havrylenko, V. M. Glazunov, A. A. Yefimov, J. J. Zhuravlev, E. R. Jonah, V. D. Kovalev, R. N. Knight, N. Y. Nusinova and other scientists.

Under the solvency of the company, we believe it should be understood the company's ability to pay its obligations for the costs that have arisen and require immediate repayment of money from existing bank accounts or in cash [1].

To maintain solvency of a company it is necessary that monetary assets conform to the needs of daily payments. To maintain solvency of a company in conditions of crisis, financial managers have to, first of all, balance the movement of funds and to restore profitability of the main type of production [2].

Balancing of movement of funds becomes possible when incoming and outgoing cash flows of the company are in conformity. It is necessary to adhere to funds saving policy and direct free funds only to production goals. In addition, it is necessary to rationally use resources and try to increase the products sales system. In crisis period, the urgent issues are the increase of the products quality and efficiency of labor. Financial activity of companies decreases due to the difficulties of obtaining

credit. Therefore, it is necessary to optimize the structure of capital and terms of engaging personal and loaned funds in this period [2].

To sum up it is worth mentioning that financial and economic crisis affects economic activity of companies. Efficient marketing policy, evaluation of payment operations, investment of free funds into assets and rational use of invested resources can provide solvency and competitiveness of a business entity and its further development. In addition, a company should rationally solve long-term and short-term management tasks at a current stage of economy development.

REFERENCES

1. Bazilinska O. J. Financial Analysis: Theory and Practice, Training. guidances. / O. J. Bazilinska - K .: Center of educational literature, 2009. - 328 p.

2. Zhuravlev Y. U. Essence of solvency / Yury Zhuravlev // Finance of Ukraine. - 2006. - №1. - S. 116-120.

3. Jonah E. E. Resolving methodological study of the concepts of "solvency" and "liquidity" // Actual problems of economy. - 2004. - № 6. - P. 30-42.

UDC 658.9

V. Kulakivska, Bachelor student
S. Legenchuk, D. Ec., Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

STATUS AND DEVELOPMENT OF LEASING IN UKRAINE AND ABROAD

Nowadays, national enterprises of Ukraine require immediate updating, modernization, expansion of fixed assets and implementation of new improved technologies. But then, there is another problem – the need to attract huge amounts of financial resources. And the most attractive investment instrument in the present economic environment is leasing. It is an alternative form of financing, which includes rent relations, elements of credit and finance. That is why, this topic is extremely relevant.

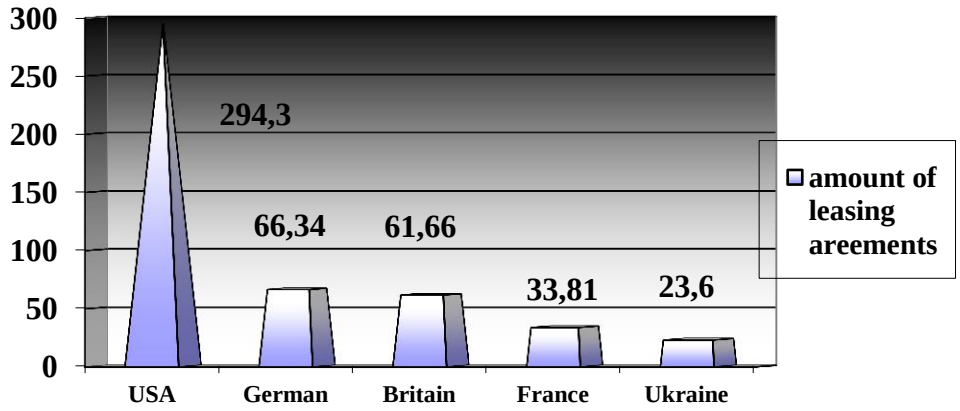
In the world practice, leasing services are widely used; they occupy the second place after bank loans. Leasing is one of the forms of capital investment in manufacture. Leading countries, such as the USA and Germany, call this kind of activity a necessary condition for the economy strengthening. In the developed countries of the world, the volume of leasing transactions are 25-30% of investments in fixed assets. In other countries with high rates of growth they are from 10 till 15 %. But in Ukraine – only 1.5%.

In such countries of Eastern Europe as Estonia, the Czech Republic, Hungary, Poland the annual leasing market varies from 2 till 5%. In Ukraine – only 0.3% [3].

According to the European Federation of Leasing Companies Associations, 28,2% of all investments are carried out as leasing transactions in England, 16.6% – in Germany, 30% – in the USA, 17.5% – in France, 26.3% – in Sweden.

In 2013 the volume of leasing market in the USA was 294.3 billion dollars (33.9% of the world market). Britain, Germany and France account for almost 80% of leasing business in Western Europe. In Germany the costs of leasing agreements are 66.34 billion dollars, in Britain – 61.66 billion dollars, in France – 33.81 billion dollars.

In Asia, the leader of leasing transactions is Japan, where the cost of leases agreements are 69.95 billion dollars [1].



Pic. 1. Comparative characteristics of signed lease agreements in the world by 2013

As for today, leasing is not a new tool (both in foreign practice and in Ukraine). However, in Ukraine the development of leasing relations are lag behind the international practice. Leasing companies' and banks' offers satisfy the total demand of leasing only at 10%. The situation is like this because many plants, enterprises, companies are willing to distribute equipment, vehicles, techniques, but cannot do it because of absence of consumers.

And it shows the necessity for further improvement and expansion of the leasing market [2, p.187].

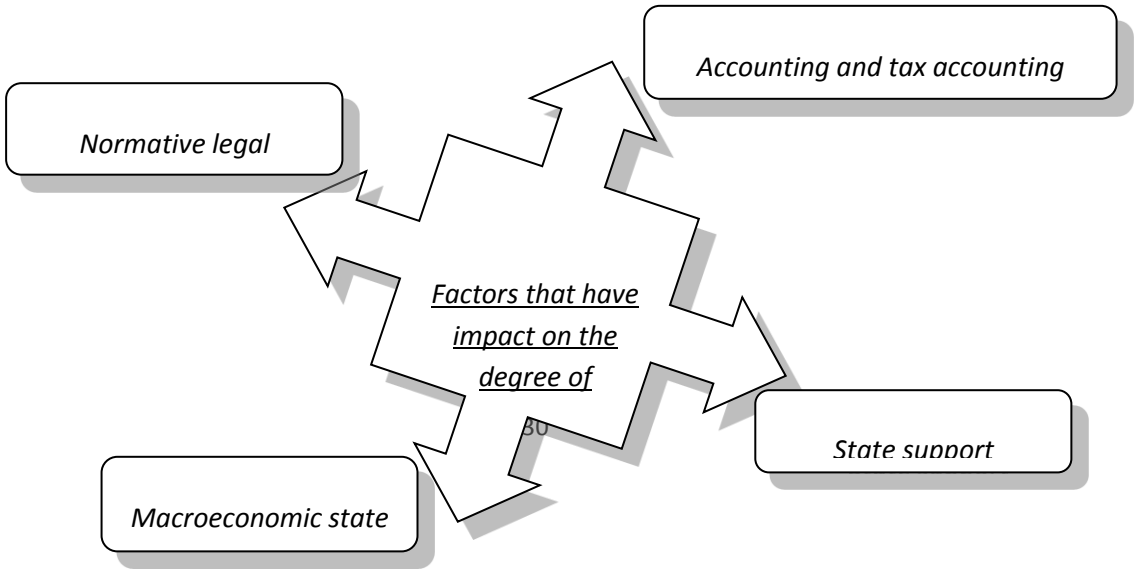


Fig. 2. Main factors of impact on the leasing market

*classified on the basis of published data [2]

We studied obstacles to the development of the investment climate. There are such groups:

- macroeconomic problems;
- imperfect legislation;
- lack of privileges to support leasing.

The first group of problems concerns the lack of the long-term crediting and inflation. These processes have had negative influence on the economy of the country on the whole. A reasonable monetary policy of the National Bank of Ukraine can become one of the ways to solve this problem. It should be an increasing interest of banks through system of privileges in long-term crediting, reducing the cost of credit resources, creation of market infrastructure.

The second group of problems is caused by imperfect legislation that leads to double interpreting of the terms, non-compliance of legislative framework, etc. That is why, the Verkhovna Rada of Ukraine should eliminate contradictions in laws and coordinate them with international standards.

The third group of problems is not less important. It is lack of appropriate privileges to support the lease.

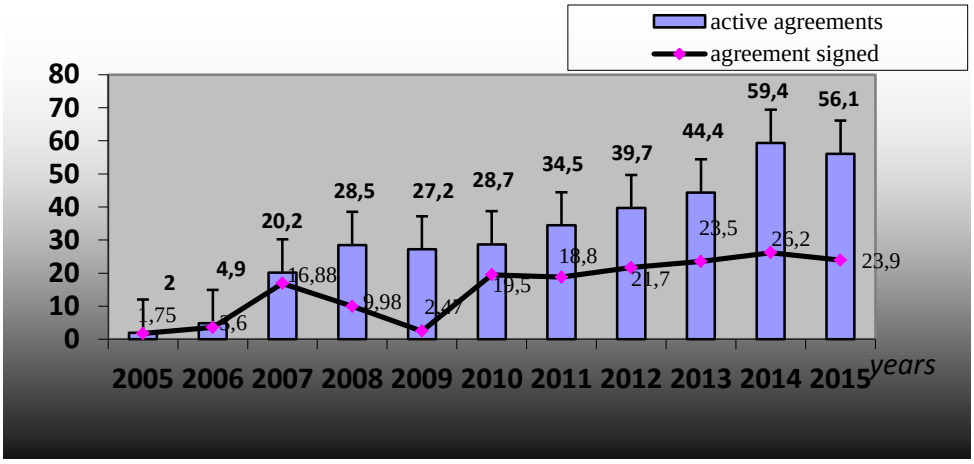


Fig. 3. The cost of signed and active agreements of financial leasing in Ukraine in 2005-2014

*based on the data of the Association "Ukrainian Association of Leasing Companies", 2014 [4]

Having evaluated the state of the leasing market for the period 2005-2014, we can make a conclusion that it had a positive trend to increase. However, economic crisis and unstable political situation in Ukraine could not but affect the market of leasing services for the last 2 years. Moreover, this trend is connected with the beginning of the world's financial crisis and reducing degree of financial stability of banks and other financial institutions, and among them the leasing companies.

Rudenko V. notes that “last year was a failure for leasing companies. Most companies closed their programs. The volume of new contracts fell by half. The leasing companies cooperated whit their new and even old clients more carefully, because of the devaluation of the hryvnia, the deterioration of payment discipline and insecurity”[5].

Therefore, Ukraine does not use all opportunities of leasing, because of several problems. If these problems are solved, there will be a huge development in the future.

In fact, the lease can give push to the restructuring of the economy, renewal of capital assets, development of small and medium business, industrialization of manufacture, increase of production and export potential.

REFERENCES

1. Global Leasing Report 2014. [Електронний ресурс] // White Clarke Group’s. – Режим доступу: http://www.whiteclarkegroup.com/knowledge centre/category/global_leasing_report
2. Бадзим О.С. Удосконалення функціонування ринку лізингових послуг / О.С. Бадзим, А.Р. Древуш // Актуальні проблеми економіки. – 2010. – №9 (111). – С. 182–190.
3. Інформаційне повідомлення щодо зустрічі члена Нацкомфінпослуг Максима Полякова із представниками ринку лізингу [Електронний ресурс]. – Режим доступу : http://nfp.gov.ua/news/540.html
4. Офіційний веб-сайт «Українського об'єднання лізингодавців» [Електронний ресурс]. – Режим доступу: http://www.uul.com.ua
5. Руденко В. Лізинг не виніс проблем [Електронний ресурс] / В. Руденко // Finance.UA, 2015. – Режим доступу: http://news.finance.ua/ua/news/-/343895/lizyng-ne-vynis-problem

UDC 330.59

Yu. Melnyk, Junior specialist student
T. Kapraluk, teacher of management and economic analysis, research advisor
N. Barbelko, PhD in Pedagogy, language advisor
Berdychiv College of Industry, Economics and Law

STATE REGULATION OF WAGES AND UKRAINIAN MARKET BASKET

Wage is one of the most important and most difficult economic category. It is both a major source of income of employees and a substantial share of production costs for employers, and effective means of motivating employees.

Wages are socio low in Ukraine. To improve this situation new methodological approaches to differentiation of wages among employees of various economic activities and regions are required.

Today Ukraine has the lowest wages in Europe and average daily wage reaches 5-6 dollars, in comparison with Africa the wages for low quality work are 6-7 dollars.

Artificial containment of wages has led that is now the cost of wages in Ukraine per unit of gross domestic product is almost twice lower than in countries with developed market economies.

Even though the military conflict in the East, Ukraine confidently believes that it can not effectively develop trade, until the war. As an example, Israel, where Arabs and Jews fought each other before the creation of Israel, and the conflict is still going, then fading, then expanding to full-scale war, has learned to prosper even during the war and increase the GDP.

A wage is an income which a person receives in exchange for work done. Employment income is usually the main source of income for most people. Today wage and other types of income in developed countries are 80% of national income.

The wages regulation system in Ukraine consists of four subsystems: state regulation; contract regulation; market regulation; regulation of wages at enterprises, institutions and organizations. The separation of these subsystems is motivated by the fact that they are relatively independent.

State wage regulation is a system which determines rules, procedures, norms and guarantees of payment for work based on the adoption of certain laws and regulations, and monitor their compliance with authorities.

The main purpose of government wages regulation is to create the necessary conditions for implementation of all basic functions of wage (reproduction, motivating, stimulating, regulatory and social) and containment the unwarranted wage increasing unrelated to production and sales (works, services) [5, p. 2].

It is worth to mention that there is no country in the world which can do without state regulation of wages, although the scope, scale, methods and procedures of such effects are different.

State regulation of work payment is based on the real financial situation of the country and interests of all sections of the population, as well as implementing the rules of conventions and recommendations of the International Labour Organisation, Constitution of Ukraine, the Labour Code, in the laws of the country. First of all the state is obliged to implement the rules and guarantees for the rights of the employee for wages, the amount of which would provide him/her and his/her family adequate standard of living. This regulation is established by the the Law of Ukraine “On labor payment”. According to this law, a regulation is done by means of:

– setting minimum wages and other state standards and guarantees, conditions and wages of employees of budget sector and managers of enterprises, based on state and municipal property;

– regulation of remuneration of enterprises-monopolists employees in accordance with the list determined by the government;

– taxation of workers' income;

– application of earned income indexation;

– compensation for the detention of payment;

– providing social guarantees to employees (pensions, scholarships, benefits for sickness and unemployment);

– finance expenditures on education, science, culture and health [1].

Payment of wages "in envelopes" was widespread in 1990th and satisfied both employers and their employees. The situation had changed in early 2000 when, instead of working life entered the insurance, i.e. pension started to accrue only from the earnings from which premiums were paid. Payment of wages "in envelopes" depriving our citizens adequate protection in the case of disability and doomed to miserable pension.

Local budgets do not receive the necessary funds that directly affects the standard of living and solving many social problems. Social funding from the budget is reduced too. Employers, entrepreneurs and employees must understand all of these. [6, p. 13]

The main issue of state regulation of remuneration is reasonable calculation and periodic review of minimum wages at national level.

In developed countries, the minimum wage acts as a living wage and protection established by one of the following methods: 1) as a percentage of the average wage (normative method); 2) depending on the average earned income for a family member (the average method). In both cases, the minimum wage is associated with the general state of the economy, production conditions that determine the income of the employed labor. The functional role of the minimum wage in Ukraine is defined in the Law of Ukraine "On labor payment".

Minimum wage is the amount of money for a simple, unskilled labor, below which no payment may be done for a full working week, hourly labor rate.

Minimum wage in Ukraine is calculated on a monthly or hourly basis and can't be less than poverty line for working citizens. Additional payments for overtime work, work in harmful, especially hazardous conditions, in special nature geographical conditions and with increased health risks, as well as bonuses to anniversaries, for inventions and rationalization proposals, other financial aid are not included in the minimum wage.

The minimum wage is a state social guarantees mandatory throughout the territory of Ukraine for enterprises of all forms of ownership and management.

The minimum wage is determined taking into account:

– cost value of the minimum consumer budget with a gradual convergence of these indicators to the stabilization and development of the economy;

– overall level of average wages;

– productivity of work, employment and other economic conditions [2, p. 171].

The minimum wage is set by Verkhovna Rada of Ukraine on the Cabinet of Ministers of Ukraine submission, usually once a year, determined by negotiations of

representatives of trade unions, owners or authorized bodies united for collective bargaining and the conclusion of the agreement.

The minimum wage is reviewed according to increased price for consumer goods and tariffs for services by agreement of collective bargaining.

After a detailed analysis of the goods and services it was taken into consideration the approximate cost of the list of minimum products which each category of citizens consume.

The resolution assigned such categories as children from 0 to 6 years, children 6-18 years, the working-age population (adult pre-retirement age) and disabled (pensioners and those who for health reasons can not work).

Prices for food have been taken from the online stores the lowest prices that can be found. In retail stores prices are slightly higher. By the way, the cheapest products are often not the best quality and sold at a discount [4].

For feeding a baby under 6 years old you need about 10 147 UAH per year, or 845 per month, pupils need 13 406 hryvnia or about 1,117 per month, adults need at least 10 162 hryvnia per year and 846 per month, pensioners – 7740 UAH per year, or 645 per month. Since January 1, 2016 in Ukraine the minimum wage is 1378 UAH, pension – 1074 UAH. So the minimum income of a family of 4 people − mother, father, children from 3 and 7 years − is 2756 UAH, but to feed all you need 3654 hryvnia. And it is not always enough to pay for utilities.

In these calculations were not included costs for salt, spices, starch, honey, dried fruits. Some minimum standards are confusing. For example, the adult population are not provided with coffee, tea, cocoa, juice, but in the list for children, these products are. By the way, there is no alcohol in the list at all. [3]

In this hard to believe, but a third of Ukrainian risk to the end of the year to be below the poverty line. Since January 1, 2016 the poverty line in the Ukraine is 1330 UAH or $ 49 per month, since May 1, 2016 - 1399 UAH, December 1, 2016 - 1496 UAH. By United Nation standards, if a person spends on food and accommodation less than 150 dollars a month it is living below the poverty line.

Doctors say that such a diet with minimal consumer basket is dangerous for health, because it is not enough for the working man. Despite numerous attempts, the content of Ukrainian consumer basket has not changed completely, and it was formed by Soviet method.

The poverty line is updated yearly by the Verkhovna Rada of Ukraine according to the Law on the State budget of the Ukraine for a coming year. In 2016 the poverty line will be changed three times: on January 1, 2016, May 1, 2016, December 1, 2016 [1].

In conclusion, the main reason of the low wage in Ukraine is extremely inefficient and unfair tax system and income distribution, imperfect guide of Cabinet of Ministers of Ukraine, destroyed economic development program and improper use of International Monetary Fund (IMF) loans for development of the country.

As a result, according to the United Nations, in Ukraine 80% of the population lives in poverty, and the gap between the incomes of the richest and poorest is in 50 times bigger.

Low wages are not an incentive for employees to achieve high end results of labor. However, using cheap labor, employers are not interested to raise productivity, investing in upgrading production facilities and personnel development.

Cheap labor leads not only to low productivity but low quality of products, so it is not competitive. Low wages are the main cause of the unprecedented growth of hidden unemployment and a significant reduction in effective demand.

Intelligent people prefer to leave Ukraine because most of them have studied 5-10 years to receive higher education, and can rely on minimum wage or wait 20-25 years to improve or increase it [7].

Thus, low wages are not only the result, but one of the main reasons of staying the Ukraine's economy in crisis. It is therefore extremely important task is the restructuring of wages, gradual increasing of wages and the creation of an effective motivational mechanism, based on a combination of economic incentives and social guarantees.

REFERENCES

1. Закон України «Про оплату праці» [Електронний ресурс]. – Режим доступу : http://zakon3.rada.gov.ua/laws/show/108/95-вр
2. Синяєва Л. Проблеми регулювання оплати праці та шляхи їх вирішення в Україні / Л. Синяєва // Регіональна економіка. – № 1. – 2009. – С. 171-177.
3. Споживчий кошик і реальність: шокуючі цифри [Електронний ресурс]. – Режим доступу : http://24tv.ua/spozhivchiy_koshik_i_realnist_shokuyuchi_tsifri_n663911
4. Доходи і витрати населення // Державний комітет статистики України. [Електронний ресурс]. – Режим доступу: http://www.ukrstat.gov.ua/operativ/menu/menu_u/dn.htm
5. Лоботюк В. Концепція подальшого реформування оплати праці в Україні / В. Лоботюк // Праця і зарплата. – 2003. – Травень. – С. 2.
6. Ривак О.С. Доходи населення України / О.С. Ривак // Науковий вісник НЛДУ України. – 2009. – Вип.19. – С. 13.
7. Державне регулювання оплати праці [Електронний ресурс]. – Режим доступу : http://library.if.ua/book/45/3145.html

UDC 336.74

O. Muliarchuk, post-graduate student of Department of Ec.,
Ivan Franko National University of Lviv, Lviv
D. Nikytenko, Ph.D. in Economics, docent, research advisor,
Yu. Veremchuk, Ph.D. in Philology, docent, language advisor,
National University of Water and Environmental Engineering, Rivne

THE MONETARY AUTHORITY'S CREDIBILITY DETERMINANTS

Under the present circumstances, identifiation of economic agents' credibility determinants to the monetary authority is an actual problem.

The determinant of "credibility" is important to implement monetary policy of the central bank. The level of credibility influences speed and quality of impulse transmission via the monetary transmission mechanism. Therefore, it is important to identify the main indicators of credibility level in central bank actions.

There are many institutional factors that influence of monetary policy effectiveness, with credibility being one of them. Generalized definition of "credibility" includes confidence in the currency, banking system, monetary policy, central bank and the state in general. As Ivan Nikolaev defines, credibility is quantitative dynamic characteristic of economic agent's relations that are based on confidence in the integrity of each other among other things. [4, p. 8]

At a high level of economic agent's confidence in the monetary authorities, the agents will open deposits and carry out investment activities. The central bank's regulatory measures find a response in the financial as well as real economy sectors, as the monetary policy transmission mechanism will operate without interference.

However, if the confidence level declines, the monetary authorities' competence is in doubt, anticipation of changes is opposite to those stated, pessimistic expectations of economic agents are formed, the monetary indicators that were declared are not perceived by them. It makes ability to predict future changes in both monetary and real sectors more complicated. Thus monetary policy effectiveness and financial stability level reduce, so economic growth slows down.

The level of confidence is influenced by the factors associated with institutional mechanisms that relate directly to the Central Bank, as well as those that are beyond its control. Y. Matskevich-Luzyak distinguishes such key determinants of trust as honesty records, transparency and independence. [1]

Honesty records show the predictability of central bank policy, which includes goals acceptable to economic entities and principles of monetary policy, implemented according to the statements of monetary authorities developed and announced for a specific period of time. These actions are the safest way to influence the level of confidence in the central bank policy, as economic agents form their expectations according to the retrospective analysis of the monetary policy's results [2, p. 33].

The second factor - transparency, is known as the disclosure all central bank aims, its legal, institutional and economic framework, policy decisions and their rationale, data and information related to monetary policy and bank regulation, to all people who might be interested [3, p. 496].

The third determinant is the central bank's independence. The independence of the central bank does not mean complete lack of control over its activities that involve other political institutions. The central bank, as a special state authority, is delegated certain functions, the implementation of which must be controlled by the society. It ought to be considered that the society can set goals and objectives for the central bank via its political authorities [5, p. 37].

The economic agent's assessment of the prospects of macroeconomic and monetary environment impacts on the level of trust. Negative assessment provokes devaluation expectations and reduce confidence in the national currency; low levels of financial literacy.

Besides the factors that influence the economic agents' confidence, the indicators that show the level of confidence should also be defined. Scientists have identified a number of indicators of economic agents' expectations regarding the future development of exchange rate. The higher the difference (in percent) between the official exchange rate of national currency to foreign currency and purchase rate on the interbank market, the lower the level of trust is. The share of foreign currency deposits in total deposits of economic entities and the share of loans in foreign currency in total loans to economic entities – the higher the level of dollarization of deposits and loans, the lower the level of national currency is.

The ratio of deposits attracted by banks to GDP reflects the tendency of the economy towards savings, and can characterize the level of confidence in the banking system.

GDP ratio of monetary aggregate M3 characterizes velocity of the entire money supply. There are two groups of factors that affect money velocity: the effective demand and aggregate supply. Growth of money velocity indicates decline in economic agents' confidence.

If the share of cash in the money supply decreases, it indicates the increase in confidence in banking system and weakening of pessimistic expectations due to real income rise and growth of propensity for savings, reduction of dollarization and temperate growth of cash in circulation compared to the significant growth in deposits.

In our opinion, arc elasticity of deposits and loans should be considered as indicators of the level of confidence in the economy (the interest rate elasticity of deposits, the interest rate elasticity of loans). If arc elasticity of deposits and loans index is less than "1", it indicates decline in economic agents' confidence in monetary authorities. If the index is more than "1", it indicates optimistic expectations to increase confidence.

The dynamics of official reserve assets has direct relationship with the level of confidence in the economy: the larger the amount of reserves, the greater the ability of the central bank to influence currency market and affect the stability of national currency.

There are some factors that reduce the level of confidence in the central bank: a negative past experience; residual effects of the crisis period; macroeconomic instability, negative trends in the main macroeconomic indicators of the country and low levels of financial literacy.

In order to increase the level of confidence in national currency, banking system, monetary policy, central bank and the state as a whole the following measures should be taken: to strengthen national currency by increasing international reserves; develop and implement training projects to enhance the economic literacy of society; improve the institutional framework; increase the level of central bank independence from the government.

REFERENCES

1. Mackiewicz J. *"Central bank credibility: determinants and measurement"*. Retrieved from: http://www.researchgate.net/publication/255574834_Central_bank_credibility_determinants_and_measurement_A_cross-country_study (Accessed March 20, 2016).
2. Drugov O. (2013). "Modern aspects of population confidence in the National Bank of Ukraine formation". *National Bank of Ukraine Bulletin* , vol. 1, pp. 32–35, available at: http://nbuv.gov.ua/j-pdf/Vnbu_2013_1_15.pdf (Accessed March 20, 2016) (in Ukr.).
3. Moyseev S. R. (2011). *Monetary Policy: Theory and Practice*. Moscow: Moscow Financial and Industrial Academy (in Russ.).
4. Nikolaev Y.A., Efimov S.V., E.V. Marushkina E.V. (2006). "Trust in the economy: a quantitative assessment. Analytical Report". Moscow: FBK, Strategic Analysis Department (in Russ.).
5. Somyk A. V. (2014). "Increased trust in banks in Ukraine". *Problemy i perspektyvy rozvytku bankivskoi systemy Ukrainy*, vol. 38, pp. 250–257 (in Ukr.).
6. Scherbakova O. (2011) "Institutional and legal foundations of monetary and credit policy implementation in Ukraine", vol. 10, pp. 36–39, available at: http://www.bank.gov.ua/doccatalog/document?id=84593. (Accessed March 20, 2016) (in Ukr.)

UDC 338

V. Netrebin, Master student
A. Overchuk, Senior Lecturer, research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

ENTERPRISE COMPETITIVENESS: THEORETICAL ASPECTS

Finding the ways to increase the competitiveness of enterprises is of particular relevance with the recent market trends. For more effective search of solutions to increase the competitiveness, first of all, it is important to give an adequate definition of it. Enterprise competitiveness was investigated by many scientists, starting with the works of A. Smith, D.Rikardo, J.C. Mill, K.Marx, J.Schumpeter and finishing with works of their followers. Today this issue is considered by many native and foreign scientists such as I.M. Akimov, I.V. Bulakh, A.E. Voronkov, V. Oberemchuk, M. Porter, V. Stivenson. Among the the factors forming the competitiveness of enterprises are volume, quality, composition, use of its potential, particularly resource potential. This includes efficient use of limited enterprise resources, that require optimization of their use.

The main objectives of this study are analysing theoretical approaches to the definition of competitiveness and presenting our own definition of this concept; identifing factors that influence the competitiveness of enterprises; researching resource potential importance in the formation of enterprise competitiveness.

The interpretation of the term "competitiveness" is quite varied. According to the classic definition of M. Porter, "competitiveness is a producer’s position at domestic and international markets defined by the set of factors and indicators."

T.B. Kharchenko defines enterprise competitiveness as a position of a country or producer at domestic and foreign markets. This position depends on economic, social and political factors.

L.V. Balabanova states, that competitiveness of the enterprise is a level of its competence compared to other competitors. The parameters for comparison are technology, practical skills and personnel proficiency, and level of strategic and current planning, policy sales, control level, communication, quality of management systems, production and so on.

Other scientists consider competitiveness as a comprehensive concept that includes aspects such as the ability of the company to sell competitive products; ability to develop a strategy that ensures a high level of competitiveness; highly qualified organizational and managerial mechanism that can perform the task; orientation of the company to market and cooperation with customers; competitive strategy and tactics in relation to competitors; trained personnel; ability to respond to changes in the environment. [1, p. 57].

Considering all of the definitions and systematizing them and taking into account the translation of the foreign word "competition" (from Latin concurrentia – competition) we offer the following general definition of enterprise competitiveness.

Competitiveness is a feature of an object, characterized by the degree of its actual or potential ability to satisfy specific needs compared to similar objects, operating at the market. [2, p. 119]. However, enterprise competitiveness is a complex comparative characteristic which should reflect the level of advantages of the company over competitors.

Analysis of enterprise competitiveness at the market allows to find out factors affecting the buyers' attitude to the company and its products and as a result – change of the market share of the company. All factors of competitiveness can be divided into external and internal.

The external factors include:

- political situation in the country;
- economic relations;
- competitors;
- concentration of production;
- law base.

The internal factors include:

-innovative nature of production;

-systems and methods of managing a company;

- marketing concept orientation.

Considering the external and internal factors we can observe the effect a particular factor has on the formation and increase of the enterprise competitiveness.

External factors include competitive environment (the market, suppliers, consumers, competitors) and the state, i.e. all government entities, bodies, the company directly or indirectly interacts with. [3, p.186].

Internal factors are represented by the resource potential of the company, which is at the center of our present study.

Businesses pay much attention to analysis of their strengths and weaknesses for evaluation of real possibilities in the competition and development of activities and funds that would increase the company's competitiveness and ensure its success. The market research uses quantitative indicators for competitiveness assessment. [4, p. 189]. The indicators prove the degree of the company stability, the ability to produce a great volume of goods in demand, and, in addition, they provide firm and stable planned results.

So, having analysed various theoretical approaches to the concept of "competitiveness" we suggested our own generalized definition.

The presented scheme of formation of enterprise competitiveness enables us to visually observe the interaction of external and internal factors that influence this process; to single out weak components, to develop recommendations for their improvement. The prospect of further research is the development of the method for

assessing the impact of these factors on the formation of enterprise competitiveness and determination of the resource potential role in this process.

REFERENCES

1. Voronkova AE Kalyuzhna NG, Otenko VI Management decisions to ensure the competitiveness of enterprises, organizational aspect Monohrafiya.-X.: WD "INZHEK", 2008.-512 p.

2. Ivanov YB, OM Tishchenko The theoretical basis of competitive business strategy: Monohrafiya.-X.: WD "INZHEK", 2006.-384 p.

3. M. Porter Competition: Textbook. posob. Per.s English - N .: Williams, 2000.-495 p.

4. Yudanov A. Competition: Theory and praktyka.- M .: Publishing House "AKALYS", 1996.-272 p.

UDC 336.648

O. Prykhodko, Master student
N. Ovander, PhD in Econ., As. Prof., research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

LEASING OF REALTY AS A PROMISING SOURCE OF COMPANY FUNDING

Capabilities of the production crucially depend on the development of non-current assets, including fixed assets.

One method of fixed assets renewal and company development is leasing. At present leasing services prove their efficiency for lessees and the profitability for lessors. They are widely used in various fields of national economy.

The most precise concept of "leasing", which distinguishes it from common loan and rent, is specified in the Commercial Code. So, leasing is an economic activity aimed at investing own or borrowed funds. Leasing means giving property on lease agreement by one party (the lessor) to the exclusive use of the other party (lessee) for a specified period of time. The property belongs to the lessor or is acquired by him by order or agreement of the lessee from the relevant supplier (seller) of the property, provided that the lessee makes periodic lease payments.

However, not all leased facilities are in demand in Ukraine. According to the analysis of the National rating agency "Rurik" the main objects of leasing for the first harf of 2015 are:

- Vehicles (75.1%);
- Technology, machines and equipment for agriculture (13.9%).

The main reasons for this demand is high depreciation of agricultural equipment and the high price of new one, that businesses are not able to buy. As for the vehicles, the reason is its rapid wear (moral and physical obsolescence), and leasing allows you to use a new object and not to buy it. In addition, a package of services is often added to the leasing and according to it, insurance, maintenance, warranty are obligations of the lessor.

A promising object of leasing is realty that is not sufficiently used today. However, any economic activity requires the office, warehouse or production areas. In our time small and medium businesses can not afford to buy realty immediately or take the credit because it is very expensive. Leasing can be a solution to this problem.

Firstly, the benefit of leasing versus mortgage is absence of commitment to the pledge, as the property is on the balance sheet of the lessee.

Secondly, in case of a mortgage the bank customer receives funding from it and does the rest of the things personally. Lessee delegates all issues to the leasing company. This allows the client to remove the risks of scams when purchasing real estate.

Thirdly, the company gets the opportunity to use the large room without simultaneous retirement of significant financial resources, since the amount of lease payments is almost correlated with the size of rent payments. The important advantage is the fact that the value of the property is not included in the balance of credit debt. This helps to improve its financial results and allows to attract additional loans. In addition, the leased asset can not be arrested.

Fourthly, the lease does not require immediate payments. The leasing agreement is more flexible compared to the loan, and according to the terms of the lease agreement the customer chooses any suitable financing scheme, and payments can be made with varying frequency and the rate can be fixed and floating.

However, despite the high potential of this type of service, in Ukraine leasing develops slowly and at a low level compared to other countries. The main obstacles that hinder the development of leasing in Ukraine are imperfection of Ukrainian legislation, inefficient system of state regulation of the domestic leasing market, the lack of qualified professionals in the leasing industry. But, active leasing implementation will contribute to renewal of fixed assets by increasing the access of enterprises to external sources of investment financing.

REFERENCES

1. Аналітичний огляд ринку небанківських фінансових послуг за I півріччя 2015 року [Електронний ресурс] / Національне рейтингове агентство «Рюрік». – 2015. – Режим доступу: http: // rurik.com.ua /documents/ research/ non_banks_2_kv_2015.pdf

2. Костенко В.М. Сучасний стан та перспективи розвитку ринку лізингових послуг в Україні / В.М. Костенко // «Молодий вчений». – 2015. – II част. - №12 (27). – С.52-54

UDC 657.1

V. Redko, Master student
I. Zamula, D. Ec., Prof.,
N. Krushynska, language advisor
Zhytomyr State Technological University

REVENUE AND EXPENSE RECOGINITION OF HUMANITARIAN ASSISTANCE IN NON-PROFIT ORGANIZATIONS

Accounting in profit organizations has some differences with the accounting in business, which economic activity purpose is profit. Although the law concerning accounting and reporting and national standards required for use as profit and non-profit organizations but some definitions in the national standards are not appropriate for non-profit organizations. In particular, the definition of cost given in P (S) 1, which connects costs with a decrease of economic benefits. And there are no economic benefits for non-profit organizations, in particular, operations to provide humanitarian aid.

On the other hand, the definition of income in the targeted funding is regulated by P (S) 15 "Income": received marking revenue recognized in the period in which incurred costs related to the conditions targeted funding. Targeted funding is not recognized as income until such time as there is no evidence that it will be received venture to meet the conditions for such funding. So the question arises: how to recognize revenue and expenses from transactions with humanitarian aid and the transfer of its recipients?

To address this issue and it was implemented a procedure for accounting of humanitarian aid, approved by the Ministry of Finance of Ukraine on December 14, 1999, №298.

Humanitarian aid is a target address assistance in cash or in kind, in the form of non-repayable financial assistance or donations or aid in the form of work, services provided by foreign and domestic donors to recipients of humanitarian aid in Ukraine or abroad.

Humanitarian aid is a form of charity and is available exclusively in compliance with art. 4 of the Act [1]. The law divides concepts such as recipients and donors of humanitarian aid. According to the Law [2], the recipients of humanitarian aid are a legal entity registered in the Unified Register recipients of humanitarian aid.

They include:

- organization of disabled veterans of war and labour, and budgetary enterprises, institutions and organizations;
- charitable organizations;

- Red Cross of Ukraine, creative unions, public organizations established for conducting environmental, recreational, amateur, sports, cultural, educational and scientific activities;

- religious organizations.

Recipients of humanitarian aid are persons who need such assistance. Guarantees of humanitarian aid with legal status may be its recipients.

Donors are persons who voluntarily provide humanitarian assistance to recipients of humanitarian aid.

In accordance with paragraphs 1.2 of Procedure №298, if humanitarian aid is obtained in the form of cash or inventory, it should reflect on Dt accounts, which accounted for cash, commodities, stocks and other property, and Kt account 48 "Targeted funding and trust income. " Thus the flow of humanitarian aid is shown as a receiver and a purchaser. Transfer grantees of humanitarian aid should be reflected in the reverse order. That is, according to the instructions №298, during the operation flow of humanitarian assistance to transfer its recipients to determine income under the P (S) 15 is not necessary, what the Finance Ministry reiterated that letter. If the humanitarian aid received for their own activities, then, according to paragraph pp.1.4 and second paragraphs 1.2 Instruction №298, we must determine income and expenses. While such operation it appears as follows:

Table 1.4

Accounting in humanitarian aid

Content operations	**Dt**	**Кt**
Receipt of cash or inventory	30, 31, 20, 28	48
Recognition of expenses	23	30, 31, 20, 28
Receiving services (with simultaneous admission costs)	23	48
Revenue recognition (realization is at a time when recognized expense)	48	745

Regarding P (S) 21 "Effects of Changes in Foreign Exchange Rates" it should be noted that the Finance Ministry determines the flow of foreign currency as a monetary item. Hence, the definition of exchange differences on monetary items in foreign currency held on the date of settlement and the balance sheet date. Exchange differences on recalculation of cash in foreign currency and other monetary items of operations recorded in other operating income (expenses). Also, please note that according to Art. 7 of the Law of Ukraine "About humanitarian aid" humanitarian aid in the form of foreign currency, payable to an account in foreign currency recipient of humanitarian aid is not the subject for compulsory sale of the interbank market and must be used only for the intended purpose [1].

So, in non-profit organizations there are many features and outstanding issues concerning the construction of accounting that determine the need for the development of appropriate regulations. The basis of such documents should be registered in the concept of non-budget non-profit organizations that would take into account their specificity, methodological features and keeping them system approach to problem solving.

REFERENCES

1. Law of Ukraine "About humanitarian assistance"

2. Law of Ukraine “About approval of determining the structure of non-profit institutions (organizations): features of the State Tax Administration Order of Ukraine, dated on July 03, 2000. Number 355 [electronic resource] / Access: http://zakon1.rada.gov.ua/cgibin/laws/main.cgi?nreg=z0451-00.

UDC 657.422

H. Reniova, Bachelor student
S. Zubilevych, PhD in Econ., Prof., research advisor
N. Zoshchuk, PhD in Phil., Senior Lecturer, language advisor
National University of Water and Environmental Engineering, Rivne

IFRS FINANCIAL STATEMENTS OF FACTORING COMPANIES: METHODS OF PRESENTATION

In modern dynamic market conditions for making reasonable economic decisions the reliable information that transparently highlights the financial position and results of the company are of urgent need. That's why financial statements prepared according to International Financial Reporting Standards (hereinafter - IFRS) acquire more and more importance in the system of information management of economic processes at different levels (macro, meso and micro)

By regulators' decision, factoring companies have started to draw up the financial statements under IFRS in Ukraine since 2013 [1, 2]. Nevertheless, it has not been investigated still how statements prepared by these companies on a new basis, considering the requirements of current legislation, satisfies their users' information needs and reveals the peculiarities of factoring companies. This fact determined the significance of the highlighted topic.

Analysis of Ukrainian legal background in factoring field and domestic scientists' points of view [10-13] created possibility to reveal a significant number of contradictions and lack of a synonymous interpretation of the essence of factoring concept. In our opinion, factoring is a financial transaction that: relates three parties (the factor, the client and his debtor), between which it is a contract that is about provider's (the client) selling to factor (bank or non-bank financial institution) its cash

claim for receivables (with or without recourse to him for credit losses, i.e., financial inability to pay), and receiving payments.

Such definition the most accurately reflects the content of this integrated service simultaneously it is considered the possibility of its providing by different financial institutions with different levels of risk (according to the essence of contract), and the various types of receivables, moreover bought receivables become factoring company's financial instrument.

Decision-making about factoring companies' services usage should be based on their financial statements, so their quality should be under special attention.

The research of Ukrainian factoring companies' financial statements since 2014 [12] are prepared under IFRS made it possible to identify certain peculiarities and imperfections that made it impossible to use all the advantages of such reporting. In particular, there is a necessity of drawing up standard forms of financial statements appointed by regulator [3, 4], interim financial statements forms limiting [6], using the typical chart of accounts of assets, capital, liabilities and business operations of enterprises and organizations.

Critical analysis of 30 Ukrainian factoring companies' financial statements identified the following shortcomings in terms of their users:

— prompting a large number of articles with no information;

— inability to evaluate the result of companies' main activities (the typical name of articles which does not allow to understand their nature or define order of indicators formation that does not include the features of a particular entity);

— no references in the financial statements to the related notes;

— Notes' low quality, actually failing to comply with the relevant IFRS requirements.

Analysis of the reporting forms published by factoring companies [12] showed that Balance Sheet, Income statement and Cash Flow statement information suffer the deformation most of all. Their content does not meet the applicable IAS [4-8] and IFRS [9].

The core business for factoring companies is providing of factoring services. However, in the Income Statement there is no information under such items as 'Revenue' and 'Cost of sales', while income and expenses of factoring services are incorporated into other operating activity. Thus, the principle of incomes and expenses matching is outraged and financial reports' users are disoriented. The analysis of domestic factoring companies' financial statements showed that in the Income Statement income and expenses on factoring transactions are represented in different ways: as a part of core activity (13% of analysed financial statements), revenue as a part of main activity and operating expenses as a part of other operating activity (63%) or as a part of other operating activities (23%). Therefore, such important characteristic of financial statements of different domestic companies provide similar services as comparability is disturbed.

In our opinion, the reporting forms should be allowed presenting the income and expenses received or incurred directly from factoring operations implementation as a part of main activity. For further information, factoring company should separate its incomes and expenses in terms of interest bearing and commission. These changes allow us to estimate the profitability of factoring transactions.

Overall, the benefits of the proposed us forms of financial statements are the following:

— a higher level of compliance with IFRS;

— representation of financial statements' elements for factoring operations such as arising from core activity instead of other operating activity that is observed nowadays;

— full disclosure of the factoring companies' specifics;

— more insubstantial perception by people who are not sufficiently competent in matters of accounting and financial reporting, but have a direct or indirect interest in the factoring companies' results;

— providing not only an analysis of companies' financial condition and results, but also analysis of individual values of factoring operations directly.

New items of financial statements formation require corresponding changes in the working chart of accounts and in the accounting policies of factoring companies. Using of typical chart of accounts makes it unavailable to disclose factoring operations. Therefore, we consider it appropriate to introduce new sub-accounts ‘Income from factoring services’ and ‘Cost of factoring services.’ Further analytical accounting accounts should include interest and commission incomes and expenses. Also for analysis, considering both internal and external users, the proposed accounts can be practiced depending on the type of counterparty with further disclosure in the notes.

REFERENCES

1. Закон України «Про бухгалтерський облік та фінансову звітність в Україні» від 16.07.1999 № 996-XIV [Ел. ресурс]. – Режим доступу: http://zakon5.rada. gov.ua/laws/show/996-14

2. Порядок подання фінансової звітності. Постанова КМУ від 28 лютого 2000 р. N419 [Ел. ресурс]. – Режим доступу : http://zakon5.rada.gov.ua/laws/ show/419-2000

3. НП(С)БО 1 «Загальні вимоги до фінансової звітності». Затв. Наказом Мінфіну України від 07.02.2013 № 73 [Ел. ресурс]. – Режим доступу: http://zakon3.rada.gov.ua/laws/show/z0336-13.

4. IAS 1 — Presentation of Financial Statements [Ел. ресурс]. – Режим доступу: www.iasplus.com/en/standards/ias/ias1

5. IAS 7 — Statement of Cash Flows [Ел. ресурс]. – Режим доступу: www.iasplus.com/en/standards/ias/ias7

6. IAS 34 — Interim Financial Reporting [Ел. ресурс]. – Режим доступу: www.iasplus.com/en/standards/ias/ias3
7. IAS 39 — Financial Instruments: Recognition and Measurement [Ел. ресурс] – Режим доступу: www.iasplus.com/en/standards/ias/ias39
8. IAS 32 — Financial Instruments: Presentation [Ел. ресурс]. – Режим доступу: www.iasplus.com/en/standards/ias/ias32
9. IFRS 7 — Financial Instruments: Disclosures [Ел. ресурс]. – Режим доступу: www.iasplus.com/en/standards/ifrs/ifrs7
10. Аналітичний огляд ринку небанківських фінансових послуг України за І півріччя 2015 року [Ел. ресурс]. – Режим доступу: http://rurik.com.ua/documents/ research/non_banks_2_kv_2015.pdf
11. Підсумки діяльності фінансових компаній, ломбардів та юридичних осіб (лізингодавців) за перше півріччя 2015 року [Ел. ресурс]. – Режим доступу: http://nfp.gov.ua/files/sektor/FK_II_2015.pdf
12. Фінансова компанія [Ел. ресурс]. – Режим доступу: http://www.fincompany.com.ua/
13. Фінконсалтингмедіа [Ел. ресурс]. – Режим доступу: http://www.zvitnist.com.ua/

UDC 336.131:338.432

O. Turovets, Master student
K. Orlova, Senior Lecturer, research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

AGRARIAN ENTERPRISE FINANCIAL STABILITY MANAGEMENT AS AN INSTRUMENT OF ITS EFFECTIVENESS INCREASE

In present conditions of management, which are characterized by crisis tendency aggravation and socio-political instability increase, the enterprises face a complicated problem of permanent and effective functioning. Agrarian enterprises financial stability management problem is of priority character in essential economic space changing conditions. To ensure agrarian enterprise functioning and development efficiency, it is necessary to improve its financial stability management mechanism.

Enterprise financial stability is its financial conditions quality characteristic. Financial stability of an enterprise is its possibility to function and develop efficiently. Financial stability means a sufficient level of ensuring financial resources and their effective management which in its turn ensures the company’s solvency and profitability.

So, management of enterprise financial stability is one of the most important functional direction of financial management system, which is closely related to other management systems. Financial stability management is a system of principles and methods of operating decisions elaboration and realization connected with ensuring such state of financial resources, their formation and distribution. Such system allows the enterprise to develop on the base of profit and capital development, keeping its solvency and supporting the enterprise financial balance [1, p. 55]

Effective agrarian enterprise financial stability management at any level of economic system includes certain stages:

- financial stability changes monitoring;
- determining the problem of found changes;
- working out steps, which ensure the given level of financial stability;
- analysis of possibilities and powers for realization of the decisions;
- implementation of the developed tasks and decisions;
- control of decisions and tasks realization.

The abovementioned stages of an agrarian enterprise financial stability management are based on a certain mechanism [2, p. 307].

Agrarian enterprise financial stability management mechanism functioning is provided by a combination of industrial, administrative, innovation and integration components which are a system of internal and external influence on a financial stability management system to make it effective in regard to enterprise vital cycle.

Financial stability management mechanism formation will give the managers possibility to use it to ensure the enterprise stable functioning and future development [1, p. 58].

Thus, when enterprise financial stability management mechanism is improved it will be possible to achieve long term goals both of the enterprise itself and the state, to stabilize national economy and to increase its competitive level in the world market.

REFERENCES

1. Ben T. H. Integrated assessment of the financial condition of the company / T. H. Ben, S. B. Dovbnya // Finance of Ukraine. - 2002. - №6. - P. 53-60.

2. Kyrylchuk S. P. Enterprise Economics: teach. manual / S. P. Kyrylchuk. - Simferopol: Fyeniks, 2013. - 444 p.

UDC 339.005.35

Y. Vaculchuk, student
N. Borodkina, Senior Lecturer, research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

CORPORATE SOCIAL RESPONSIBILITY

Corporate Social Responsibility is the responsibility of enterprises for their impact on the society.

In modern economy the reputation and image of a company depends on its social position. A company enjoys confidence of the society if it declares such values as stability, openness, honesty, integrity and respectable attitude to all participants of internal and external business processes. This is the basis for the formation of the institute of trust, which is of particular importance in ensuring the economic, environmental, social, labor and regulatory balance between the company, shareholders, directors, employees, consumers, suppliers.

In Ukraine CSR appeared only at the beginning of the 20th century. In 2006 the Ukrainian Global Compact Network was founded with the support of the UN Office in Ukraine, which focused on the promotion of Global Compact principles by Ukrainian companies and other interested parties. Such institutions as business associations, trade unions, employers' associations, and academic institutions that support the Global Compact (GC) principles on human rights, labor standards, environmental protection and corruption combating started integrating these principles into their activities [4].

External communications of an organization become extraordinarily important for the modern conduct of business. The work on creation and support of image and reputation of the firm is provided by the separate departments of public relations or by the departments of communications in large organizations, in organizations of small and midsize businesses - by marketing departments, that also work with marketing communications [1, p.25].

Business CSR now becomes the original instrument of advancement of the company or the corporation on the national and world markets. Originality is in combination of economic and social results: positive status of the company promotes its profitability.

Among the mostly often mentioned advantages of introduction of the CSR programs are:

- Improvement of processes efficiency. When introducing the CSR programs, companies find the hidden levers of efficiency increase that would not be possible to see otherwise. It especially concerns technological processes. For

example, if not to search ways to reduce emissions purposefully, the technology may change very slowly;

- Increase in employees motivation and productivity. As all the company workers at the same time are citizens, consumers, parents and residents of a certain city, the care about society will transform into the care about the workers. Psychological factors of motivation to work are very important for any organization;
- An increase in cost of non-material assets. It is an increase of business and general public reputation of the company, reduction of risks from the possible loss of markets, improved access to the new markets due to the best reputation. Introduction of active policy in the field of CSR presents the real benefit for companies [5].

Socially responsible business is in one semantic field with the concept of conception of the social and ethic marketing, that supposes, that the "task of the firm is to determine consumers needs, needs and interests of target markets, and to provide with the desirable level of satisfaction of these needs more effectively and more productively, than the competitors do, with simultaneous maintenance or increase of welfare of consumers and society on the whole. Such conception directs a firm not only to receive incomes using any ways, but also to get the status of the company that cares about the development of society on the whole" [3, p.20].

Such facilities of marketing communications, as advertisement, public relations, branding, sponsorship and others like that, are designed to form the attitude of public toward organization as to socially active business.

Benefits that are obtained by business from implementation of principles of social responsibility are as following:

- an increase of trust of population to the company activity, its commodities and services;
- an increase in professionalism and development of skilled staff potential at an enterprise, loyalty of the personnel;
- accordance to the norms and standards of the world economic community;
- possibility to form the partner relationships with power-holding structures, public and mass media [2, p.35].

CSR is a competitive advantage of a company, due to which the unproductive costs of an enterprise increase its market value owing to a collective intellectual capital, competitiveness of products, services, and support the solution of social, ecological and economic problems of the society. In modern conditions in Ukraine only large companies that function in the most profitable economic activities have the potential to implement CSR.

REFERENCES

1. Воробей В. Корпоративна соціальна відповідальність чи вигода? / Воробей В. // Києво- Могилянська Бізнес Студія. – 2005. – №10. – С. 25-36
2. Охріменко О.О., Іванова Т.В. Соціальна відповідальність. – Навч. посіб. – Національний технічний університет України «Київський політехнічний інститут». – 2015. –180 с.
3. Примак Т. О. Маркетинг : навч. посібник [Текст] / Т. О. Примак. – К. : МАУП, 2004. – 228 с.
4. Посібник із КСВ. Базова інформація з корпоративної соціальної відповідальності /Кол. автор.: Лазоренко О., Колишко Р., та ін. – К.: Видавництво «Енергія», 2008 – 96 с.
5. Стратегія сприяння розвитку соціальної відповідальності бізнесу в Україні на період до 2020 року [Електронний ресурс] Режим доступу : http://www.svb.org.ua

UDC 657.471.1:665

V. Yurevitch, Bachelor student
K. Shymanska, PhD in Acc., As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

PRODUCTION COSTS IN FOOD ENTERPRISES

Manufacture of food products and the development of the food industry is a strategically important area of the national economy for the country. The Ukrainians spent 509.3 billion grv. in 2015. This is 38.4% of the total costs [1]. Ukraine is integrated into the global market and is currently its proposal of global food commodities is more than twenty commodity offers, the first step in this position is cow milk (fresh milk), the production of which in 2013 according to FAO totaled 10,804 thousand t. [2]. Thus, Ukraine has a significant potential for the development of the dairy industry, that is why the viability of the industry will play a crucial role in the further establishing of our country as a country known in Europe for quality food. Therefore, the accounting and control of production costs becomes essential.

Production costs are not only important economic category, but also accounting and analytical as they are essential objects of accounting, analysis and control. Production costs have a great share in the cost structure of the company, form the cost of finished products, which ultimately determines the amount of expenditure in the period of its implementation, and therefore significantly affect the volume and dynamics of profit. The goal of any enterprise is profit maximization, and resolving this issue is usually seen in the reducing of expenditures and costs of manufactured products, which is a major problem in the costs management and gives rise to management accounting.

The study of the practical aspects of accounting at the dairy plants resulted in focusing the study on the feasibility of the developing of additional analytics cuts taking into consideraration the accounting process for such enterprises.

The methods of analysis and synthesis used in the study contributed to grounding of the system of production costs analytical accounts by studying the need for improving the analyticity of accounting information for management purposes and on the basis of implementing the multilevel nomenclature approach to the systematizing of the production costs taking into account the characteristics of the food industry. The study revealed the following.

The analytical account of the account 23 "Production" is on the types of production, expenditure and types or groups of the products produced. In large industries the analytical cost accounting can be conducted by departments and cost and responsibility centers of the enterprise [3].

In the food industry the analytical accounting cutsof production costs must be introduced taking into account the following factors: the type of raw material, the product type, the product weight (packing), the period of manufacture, the batch number and others.

The need for analytics exists because in large and medium-sized enterprises, where there is a large number of product types, it is very important to share costs among departments, allotments. The advantages of such detailing is fast processing of data on consumption of raw material for the production of finished products according to their types, movement of unfinished production among the allotments, and the volume and structure of production.

In addition, enhanced multilevel analytics allows better and accurate costing for each product that promotes reasonable pricing.

REFERENCES

1. У Держстаті порахували, скільки українці витратили на їжу в 2015//gazeta.ua [Електронний ресурс]. – Режим доступу :

http://gazeta.ua/articles/economics/_u-derzhstati-porahuvali-skilki-ukrayinci-vitratili-na-yizhu-2015-roku/686811/.

Циган Р.М. Тенденції та перспективи розвитку харчової промисловості в Україні / Циган Р.М., Безпарточна В.І., Похила М.О. // Електронне наукове фахове видання Миколаївського національного університету ім. В.О. Сухомлинського "Глобальні та національні проблеми економіки". - 2015. - № 8 [Електронний ресурс]. – Режим доступу : http://global-national.in.ua/archive/8-2015/58.pdf/.

3. Інструкція про застосування плану рахунків бухгалтерського обліку активів, капіталу, зобов'язань і господарських операцій підприємств і організацій,затверджена наказом Міністерства Фінансів № 291 від 30.11.1999 р./Міністерство Фінансів України [Електронний ресурс].– Режим доступу: http://zakon2.rada.gov.ua/laws/show/z0893-99/.

UDC 657.1

D. Zakharov, student
V. Ivanenko, PhD, As. Prof., research advisor
N. Krushynska, language advisor
Zhytomyr State Technological University

FACTORING AS A NEW FINANCIAL INSTRUMENT IN UKRAINE

The article considers factoring as a special form of financing enterprises and the importance of its development in Ukraine.

One of the main problems of the economy today is access to international markets. This situation requires the use of financial instruments that can meet the needs of economic operators. These financial instruments should be adapted to the economy of foreign countries. Currently, one of these tools is factoring.

Factoring is a new category for business practice in Ukraine. It is studied only a little, but the phenomenon is increasing in annual distribution. Factoring Services are one of the young but already an integral part of the financial market in Ukraine. As factoring activity is not covered in the Ukrainian literature there is a need to continue the research.

Factoring whish means funding system under which the company is the supplier of products and passes the short-term requirements for trading operations banking institution (factoring companies).

Participant of factoring transaction is a client - supplier of goods and services, which departs factor receivables to the factor to a third party (the debtor); factor - financial institution has the right to factoring transactions; debtor - buyer of goods and services, which is a debtor to the supplier [3, p.122].

Factoring is often compared to a loan, but this comparison is not appropriate as factoring and credit solve various problems and are not similar in nature. The main difference is that credit is given basing on the performance of the company, which emerged in the past. But factoring financing is aimed at achieving the future, the future development of the company. Another important difference is that in factoring debt means money from debtors, while the loan borrower is required to repay the funds themselves.

Factoring is divided into different types. International and native experiences are two main types of factoring: with recourse and non-recourse. The main criterion factoring division into species is the one who takes risks on collection of receivables. Non-recourse factoring can be described as a sale of receivables, as the risks are transferred to the factor. When recourse factoring risk of default assumes the company, the non-payment of receivables factor can recover the debt from your client. It should be noted that non-recourse factoring is the most common in Ukraine and abroad. Non-recourse factoring is given rarely and only proven by reliable customers. Under the factoring agreement the supplier provides the transfer of

factoring unpaid debt. This debt claims arising between the contracting parties in the implementation of goods and services in terms of commercial credit, combined with elements of accounting, information, marketing, insurance, legal and other service provided [2, p.226].

For debt transferred to the customer it should be provided the original proof of shipment. Factor in turn promptly transfers money to the account of the client, but not more than 90% of the debt. Total percentage of debt that will be transferred depends on the reliability of the client. Listing the debt does not fully insure its risks. The remaining amounts are transferred liabilities carried out after obtaining the factor of money from the debtor. Major factoring fee is deducted from the amount of funds transferred to the taxpayer in terms of repayment of each invoice transferred for factoring services. Monthly payment of interest is not required. [1, p.78].

The main advantage of factoring is that the client realized their debt to factor very quickly and can get funds to run them in turn. This advantage is the key feature of the popularity of factoring.

Factoring started to gain popularity as the traditional scheme of conditions on commercial credit for suppliers. This burden is shown that the build-up of speed, proportionally increasing shortage of working capital due to delay payments. Long periods between the cost of purchasing goods and receiving income from sales have always a negative impact on the production process. Today, quite a large number of domestic enterprises proved unable to manage effectively accounts receivable, which has an economic harm to the company the creditor. With self-management of accounts receivable in order to accelerate the maturity it is necessary to carry out deep analysis of credit quality, temporarily execute settlement of documents; apply a deposit, bill payments and other advanced forms [5, p.80]. Where the company uses factoring, the factor assumes the responsibilities of debtors monitoring, analysis and most importantly their ability to pay, since the client is also interested in repaying the debt. Thus management of accounts receivable is effective and reduces the risks of default. Factoring unlike insurance companies 100% eliminates the risk of non-payment by the buyer [4, p.262].

The main task of factoring is equipped with such a system of relations between buyer and supplier of goods in which the vendor could provide a competitive deferred payment to its customers without feeling its working capital deficit. This is possible due to the financing of early deliveries with deferred payment bank factor in vendor convenient mode.

Despite the crisis in the economy, factoring in Ukraine is developing. Of course, this kind of financial services underestimated in our country. An important advantage of factoring is that it is available not only for big business, but also for small and medium. In a crisis, the value of this resource is constant and does not increase, in contrast to bank loans. The main factors for the further development of factoring operations in the country is the increase in production, improve the

solvency of the defendants in a market economy, reducing inflation, improving the resource base.

REFERENCES

1. Зеленіна О.О. Бухгалтерський облік факторингу як елемента позикового капіталу підприємства / О.О. Зеленіна // Вісник ЖДТУ: зб. наук. пр. Сер. "Економічні науки". – Житомир:. – 2010. – № 4 (54). – С. 78-81
2. Левченко О.М. Факторинг: методика облікового процесу / О.М. Левченко //Актуальні проблеми економіки. – 2010. – № 11 (113)
3. Макарович В.К. Особливості факторингових операцій в фінансовому та податковому обліку / В.К. Макарович // Вісник Житомирського державного технологічного університету / Серія: Економічні науки. – Житомир: ЖДТУ, 2012. – №3 (61). – С. 122-126
4. Непрядкіна Н.В. Переваги розвитку міжнародного факторингу в Україні / Н.В. Непрядкіна // Вісник економіки транспорту і промисловості. – 2014. – № 45
5. Орєхова А.І. Особливості управління дебіторською заборгованістю // Матеріали науково – практичної конференції викладачів, аспірантів та студентів Сумського НАУ (20-29 квітня 2009р.). – В 3т./Т.ІІ. – Суми: Видавництво «Довкілля», 2009

UDC 657.1

O. Zhuravel, Master student
S. Pavlova, PhD in Econ., research advisor
L. Mohelnytska, PhD in Phil., As. Prof., language advisor
Zhytomyr State Technological University

ENSURING COMPETITIVENESS OF ENTERPRISE

The central concept that expresses the essence of the market economy is the concept of competition. Competition is the most important link in the whole system of market economy. The incentive that encourages people to compete, is the desire to outdo the others, and competition is a dynamic process that provides the market with better goods.

The company's achieving a competitive status is directly connected with the promotion of its products to specific groups of consumers and it depends on complete satisfaction of their demands. Competitiveness of a product is the result of good functioning of a competitive enterprise. To ensure the competitiveness of the product it is necessary to effectively control factors, conditions and causes that determine the quality of goods, production costs and achieving maximum consumer impact.

Competitiveness of goods is a parameter that characterizes product market position at a certain time and does not reflect the long-term prospects of the company development.

The competitiveness of products is determined both by the image and prestige of the company that manufactures this product and commercial and trade specialists working on presentation and sale of goods to consumers.

The management of product competitiveness and its manufacturer is the subject of numerous scientific works of native and foreign authors. An important scientific contribution to solving the problems of competitiveness was made by B.Burkinskyy, B. Gerasymchuk, M.Gerasymchuk, M. Yermoshenko, A. Zapunnyy, A. Kuzmin, E. Krykavsky, J. Plotkin, A. Starostin, F. Hops, V. Shinkarenko, E. Golubkov, G. Azhaldov, G. Bahiyev, B.Berman, A. Hlichev, P. Zavyalov, B.Karloff, Kotler, JJ Lambe, Porter, E. Reichman and others. The works of these economists, which defined the methods and conditions for ensuring product and company competitiveness serve a scientific and theoretical basis for deeper studies on competitiveness.

Product competitiveness is formed successively at all phases and stages of the business cycle. As noted in a number of researches, competitiveness is formed as the sum of the manufacturer's efforts to ensure product quality at the stage of preproduction marketing, at all stages of production and during products maintenance.

Let's consider the model providing product competitiveness. It contains both the conditions and steps to achieve it.

Block 1. Preproduction marketing. It deals with studying the causes of unmet consumer demands and the development of measures to meet them.

Block 2. Production. It considers quality assurance at the stages of product delivery, manufacture and sales.

3. Product use. It means product quality assurance during its warranty, aimed at storage and competitiveness increase during the repair and maintenance period.

The concept of modeling competitiveness is based on using quantitative methods of evaluation, well-known scientific methods and measurements; and on relative competitiveness of enterprise.

Product competitiveness parameters are quality, production costs, price, discounts, payment and delivery terms, brand prestige, packaging, maintenance, service, warranty, environmental product safety, patent protection, life service etc. Product competitiveness largely depends on the company-producer.

Summarizing, the following ways to increase the competitiveness of products can be distinguished: cutting production costs and prices; improving product performance, reliability and design parameters; improving market research and advertising, certifying the product.

REFERENCES

1. Блонська В. І. Вдосконалення конкурентоспроможності та підвищення ефективності діяльності підприємства внаслідок ефективного управління / В.І. Блонська, І. В. Шморгун // Науковий вісник НЛТУ України. – 2010. – Вип. 20.6. – С. 174 – 180.

2. Porter M. Competition. – USA: Harvard Business School Publishing Cooperation, 2008. – 544 c

Session work №4

CURRENT RESEARCH IN THE FIELD OF HUMANITIES

UDC 614.253.5-613.95:613.25

A. Artemenko, chair "Nurse business"
V. Svyrydyuk, M.D., Prof., scientific advisor
Zhytomyr Institute of Nursing, Zhytomyr city, Ukraine

FEATURES OF TEENAGERS OBESITY

Actuality of theme. The problem of obesity is the focus of modern medicine. WHO regards obesity as an epidemic that has gripped millions of people. Obesity has negative effects on the physical and mental health, alters metabolism, especially in children and adolescents, that makes the problem very important.[1,3]

The purpose is to examine the risk factors of obesity in adolescents.

To achieve the goal it was used medical and sociological research - a survey of 120 nurses with specially elaborated questionnaire. Among the respondents were 30 students of 1st year, 30 bachelors and 30 masters in specialty "Nursing" of Zhytomyr Nursing Institute, and 30 nurse practitioners of Zhytomyr region.

The results and discussion. It was found that almost half (43.3%) adolescents subjectively incorrectly estimate their own weight when comparing it with an objective criterion - a body mass index (BMI). It was found that among adolescents (nurses 1st year) there were persons with a BMI <18.0 kg / m2 was 16.7% (lack of body weight), individuals with a BMI> 18.1 <25.0 kg / m2 was 63 3% (normal body weight), individuals with a BMI> 25.1 <30.0 kg / m2 there were 20.0% (overweight). Among those examined adolescents it was not found any person with obesity. Among bachelors the deficiency of body weight was found in 3.3% of cases, normal body weight had 70.0%, overweight persons there were 26.7%. Obesity among nurses-bachelors was not observed. Among the masters of nursing there were neither persons with obesity nor people with the decline of the power (malnutrition). Instead, 66.7% of persons had normal body weight and 33.3% were overweight. Among nurse practitioners there were no individuals with the deficiency of body weight. The normal body weight had only 50.0% of patients, 43.3% were overweight and 6.7% of observed had obesity.

Conclusions.

1. Among adolescents there is a significant proportion of people overweight.

2. There is a tendency with age for increasing the proportion of persons as overweight as with obesity.

3. The correlation of people overweight to people with normal body weight in adolescents is 1 to 3; in bachelors - 1 to 2.6; in masters is 1 to 2.0; in nurse practitioners is 1 to 1.

4. Metabolic disorders started in childhood and adolescence as overweight turn with age into obesity in adults.

REFERENCES

1. Obesity. Mayo Clinic. [Електронний ресурс]. Режим доступу: http://www.mayoclinic.org/diseases-conditions/obesity/basics/definition/con-20014834

2. Obesity. Get the Facts on Guidelines and Statistic. [Електронний ресурс]. Режим доступу: http://www.medicinenet.com/obesity_weight_loss/article.htm

3. Obesity. WHO. [Електронний ресурс]. Режим доступу: http://who.int/topics/obesity/en/

UDC 614.253.52:616.127-005.8:615.8

J. Chekh, student
I. Lishchyk, the lecturer
N. Eremeeva, language advisor
Zhytomyr Nursing Institute

NURSING REHABILITATION PROCESS IN PATIENTS AFTER MYOCARDIAL INFARCTION

Key words: nursing process, rehabilitation, myocardial infarction, nurse, the patient.

Actual topics: myocardial infarction is one of the mortality causes, temporal disability, disability of the working layer of the Ukrainian population that leads to the economical loss to the state. As the result the issue of the rehabilitation of the patients with the myocardial infarction is particularly important.

For now the Cardiac Service has the greatest experience in the medical rehabilitation of the patients in comparison with the Therapeutic Services of Ukraine. However the nursing process doesn't fully used in the Practical Healthcare.

Using the nursing process in the practical healthcare of Ukraine has to be useful both for the patient and the family: it urges them to take an active part in the treatment and the rehabilitation, involving the in the whole three steps of the nursing process [1, c. 23].

The nursing process has to increase the sense of satisfaction from the job and positively affect upon the professional growth among the medical workers. It noticeably improves the relation “the nurse – the patient”. Moreover the using of the nursing process promotes the development of the cognitive, engineering and interpersonal skills.

Learning of the international experience of the nursing development shows that rational use of the nursing staff significantly contributes to the improvement of the quality, availability and cost of medical care to people, the effective use of the resources in the healthcare and prevention of disease complications [4, c. 7].

The research aim: to explore the effectiveness of the implementation of the nursing process in the rehabilitation of the patients with the myocardial infarction.

Objectives of the study:

1. to carry the analytical overview of the literature through this problem.
2. to analyze the existing national approaches to the organization of the nursing process among the nurses for the effective rehabilitation of the patients.
3. to prove the promising approaches to the nursing process in the nurse activity for the effective rehabilitation of the patients with the myocardial infarction.

Results and discussion: The rehabilitation is the combined and coordinated use of medical, mental, social, pedagogical and professional measures to prepare and retrain the personality for the further effectiveness of employment.

The restorative treatment of patients with myocardial infarction are carried out in several stages:

- inpatient wards of hospitals (the first step);
- specialized spa establishments (the second step);
- outpatient facilities and the Institute of Cardiovascular Surgery (the third step).

The organization of the rehabilitation programs is based upon the principal of the strong individualization.

The permanent monitoring of the patient helps to evaluate the patients coronary reserve and the physical state, shows the dynamics of clinical symptoms of the disease.

It becomes clear that the qualitative and effective implementation of the nursing process provides multidisciplinary approach – such organization of medical-care that provides complexity, continuity, straightness of the quality of the medical and social help and the mental support.

The nursing process is the scientific nurse method of clear provision of nursing care and some care scheme. It provides support of the optimal health of the patient.

Thanks to the nursing process the nurse is able permanently to collect and critically analyze the information, make conclusion about the response to care, the real opportunity to implement the plan of care and existence of new problems that have to be noticed.

Conclusion: As follows the nursing process in rehabilitation is the implementation of the optimal program for the every particular patient that provides creation the most favorable physical, mental and social conditions. The active influence plays an important role upon the personality of the patient by means of organizing the lifestyle, restore the lost personal significance of the individual, so the doctor's and the nurse's tasks of the Rehabilitation Service are the medical, social, and labor rehabilitation, because these components are closely linked and the absence of at least one of them unable to achieve the desired result.

REFERENCES

1. Гайдаєв Ю.О., Корнацький В.М. Проблеми здоров'я та напрямки його покращання в сучасних умовах // Український кардіологічний журнал. – 2010. – № 5. – С. 12–16.
2. Лісовий В.М. Основи медсестринства: підручник/ В.М. Лісовий, Л.П. Ольховська, В.А. Капустник. – 2-е вид., переробл. І допов. – К.: ВСВ «Медицина», 2013. – 792 с.
3. Медсестринство в терапії: Підручник/За заг. ред. М.І. Шведа, Н.В. Пасєчко. – Тернопіль: Укрмедкнига, 2010. – 546 с.

UDC: 371.3

M. Cherepansky, student
S. Kobzar, Senior Lecturer, research and language advisor
Zhytomyr State Technological University

INTERNET ADDICTION

Nowadays more and more human work is being given to machines and computers. This is called "mechanization" – the replacing of manual work with machine work, especially in difficult and laborious processes. It is a part of the scientific and technological progress – a forward movement of science and technology, all elements of evolutionary development of the productive forces of social production based on extensive knowledge and development of the external forces of nature [1].

It is obvious that not only human work is replaced by automatic one, but also the ways people spend their free time. For example, before the age of computers, to have fun people gathered together, listened to rumors, shared gossips, got to know each other and just communicated. Today all we need to make some new friends is just to double-click a button. Entertaining is also changing. It has become more online and individual. Most of the entertainment now is happening on the Internet.

Internet is the place where a big load of information is situated. All this information is supposed to give people a chance to get any data they need, to let them

learn more and more, to improve their intellect, and to satiate the thirst for knowledge so typical for human race. It is really easy to get any information now, but most of the time we spend on the Internet is not searching for some new info – it is the time spent entertaining and chatting online. So called “surfing the Internet” is taking more and more time. Especially it is visible on children.

Statistics gathered in Greece shows that students of secondary and high school devote a lot of time downloading music from the Internet, downloading photos, games, and communicating with friends in social networks (Facebook, Twitter, etc.). Percentage increases depending on age: 14.1% - 11 year-old, 25.8% - 13 year-old, 33.7% - 15 year-old. The results are different and depend on gender: 26.8% - boys, 21.9% - girls. From 2006 to 2010, the number of teens using the computer at least three hours each day quadrupled (from 5.7% to 21.7%). Furthermore, at least one of the six fifteen-year-old adolescents showed the signs of addiction to the use of the Internet. 5.5% of adolescents, especially boys, exhibit symptoms of video game addiction. Three of five fifteen-year-old students (59.4%) spend more time on the Internet than they originally planned. Two of five teenagers (42.3%) admit that they are constantly thinking about the Internet, one of three (30.8%) uses the Internet as a way of escaping their problems and letting out negative emotions such as hopelessness, guilt, stress, depression, etc. [2].

Now people spend most of their time in their own little worlds – they use laptops and smartphones, PC’s and lots of other electronic devices, but they communicate with each other much less in real life. People now have a lot of devices to live alone and to handle all the situations on their own without any help of other people. We study to live alone, unsocial, unconnected in reality.

Modern technologies are used for great purposes – fast building, space discovering, medicine and cure, saving people’s life. But the way entertainment is developing doesn’t lead us to bright future; it has made the very life pretty much colorless. We live in the world where young people prefer to play online games to going outside and having some fun with their friends in the open air.

A research made in Russia investigated free time of the university students. The respondents had to answer two questions: “How much free time do you have?” and “How do you mainly spend your free time?”.

Answering the first question 47% said that the free time they have is from 2 to 5 hours, 24% of the respondents have 1 - 2 hours of free time, 18% can boast the possibility to deal with personal matters for more than 5 hours. And only 6% have less than 1 hour of free time. 1% of the respondents noted that they do not have free time at all.

And here are the answers to the question "How do you mainly spend your free time?" (Respondents could select an unlimited number of options):

- I sit on the Internet - 79%
- I communicate with my friends - 58%
- I read art books, newspapers, magazines - 39%

- I watch TV - 38%
- I am engaged in sports - 32%
- I go to the movies - 32%
- I read textbooks - 21%
- I go to the theaters, museums - 11%
- Other - 3% (without specifying the variants)[3].

As we can see from these two researches there is a risk of increasing of the Internet addiction among adolescents. Active research on the impact of excessive and uncontrolled use of the Internet leads us to the conclusion that this problem is becoming more and more urgent. The consequences can be terrible and will not keep society waiting.

REFERENCES

1. Scientific progress / Wikipedia, the free encyclopedia [electronic resource] // https://en.wikipedia.org/wiki/Scientific_progress
2. Athanasios Koliofutis. Internet addiction of adolescents. Statistical data / Pemptousia. Mount Athos – Wisdom – Holiness [electronic resource] // https://www.pemptousia.ru/2013/07 /
3. 58% русской молодежи не привыкли бить баклуши / Анкетолог. Институт общественного мнения [electronic resource] // https://iom.anketolog.ru/2013/06/10/dosug-molodegi

UDC 130.001

T. Chorna, English teacher
Kamyanets-Podilsky Industrial college

ABOUT MOTIVATION

The article investigates the importance of using drama techniques which help teachers to motivate students. The reason of using drama may be that it draws on the entire human resources and makes class activities enjoyable.

Much head-scratching goes on over the «problem» of how to interest students in the language they are supposed to be learning. Many techniques have been tried – some crafty, some crude -to generate interest. Certain teachers believe that the only way is to let their students do what interests them most; often they come away disheartened: «They aren't interested in anything», or «They're never interested in the same thing». Others try abandoning the next-book, but then «The students feel they aren't learning anything».

There can be no neat solution to motivation, but the «problem» can be partly solved by asking, honestly, what those twenty or thirty people are trying to do *together* in the room. Surely, if communication is always on a one-to-thirty basis (i.e.

from teacher to students), a great number of other possibilities are being wasted. A question from the teacher to one of the students is of direct interest to only two people in the class, though it may be of indirect interest to more. Drama helps us to keep all thirty people active all the time by making use of the dormant potential in the room. And, far from making the teacher's task harder, it actually relieves him or her of the burden if trying to do the impossible: keep thirty people active at the same intensity and the same time. For, if the class is working in, say, five groups of six, the teacher's attention is spljt only in five ways and not thirty. The argument that the teacher can still not control what is happening in each group is surely spurious, for in facing the class he or she can control only one person at a time and cannot be aware of what is going on in the heads of the other twenty-nine except by constantly switching attention from one to another and keeping the students alert by cross-fire. Who then is doing *all* the work? The teacher. And what is he or she the teaching?

Drama activities do not allow the teacher to gain a false sense of achievement by dispersing energy in all directions. They oblige him or her instead to stay on the edge of what is going on and not to crack the whip in the centre of the ring. They also help to get rid of the diffidence and bodedom that come from being forced so stay passive most of the time. There is no place here for stereotyped responses, set-up discussions, pre-planned arguments or «free conversations» in which everyone speaks and nobody listens, or else nobody speaks and the teacher is left to quench the fire started by his or her own burning questions. In a sense, motivation is not needed when working through drama, because the enjoyment comes from imaginative *personal* involvement, not from the sense of having successfully carried out someone else's instructions.

From the evidence to hand there is little doubt that these techniques are an axtremely powerful motivational factor. Earl Stevick recently underlined the learner's need to feel a sense of «belonging» (peer group acceptance) and security, and also to invest something of his own personality and so to enjoy a certain «self esteem» *(Memory, meaning and method,* Newbury House 1976). The techniques fill precisely these needs.

If drama is motivating – and we believe it is - the reason may be that it draws on the entire human resources of the class and that each technique, in its own way, yields a different, unique, result every time it is practised. Nobody can predict what exactly will be thrown up in the way of ideas during these activities. This is what makes them enjoyable. We have, certainly, tried to predict some of the language that will be needed, but the language is only part of the activity. The other part is a compound of imagination, spontaneous creation and chance discovery, which depends on the students working together. An illustration if this is the apparently tightly-controlled exercise 3.18. The hotel receptionist, which offers little freedom of choice to the student «performing» and yet regularly provides striking and entertaining new ideas, all based on the same stimulus – a single sentence on a slip of paper.

By working togethet, the students learn to feel their way to creating their own parts and adapting them as they come up against others. The problem of not wanting to speak or, more often, not knowing what to say practically resolved because the activity makes it necessary to talk. One of the more obvious explanations for this is that the students are moving *physically,* as most of us are when we talk, which means that they can change partners and break away from exchanges that might begin to flag if they were kept up too long. Another reason is that they are learning to rely on one another for their ideas and therefore using a considerable amount of language for *discussion,* argument, agreement and disagreement, organization and execution.

It is interesting to listen to what is said at the beginning of most activities. Directive language will dominate for some time, «You'd better …», I'll (lie on the ground) and you …, «You begin, all right?» and so on. Once the skeleton of the activity has been built up, the *directive* language will be replaced by that of *discussion,* «Wouldn't it be better if…?» , «I thought we were going to…», «That won't work…». This will be mixed in with whatever language may be involved in the sketch ifself. In the final stage, we will have the language of *commentary* or *criticism,* as one of the groups tries to explain how it reacted to a sketch – «Oh, we thought you were…», «Weren't you …?» , «Why were you …?»

This constant interchange is extremely difficult to achieve in a class where the focal point of the activity is often a text or a theme for discussion presented to a captive, seated audience. It is true that the language produced during many of the drama activities passes uncontrolled (by the teacher) and that most of what is said is heard by only two or three people, nevertheless, the whole class is actively engaged nearly all the time. Moreover, the words being «wasted» on two or three pairs of ears are perhaps the most valuable, for every student needs periods in which to practise what he or she knows without restraint, without fear of being wrong. Students need the occasional chance to take risks in the language, to try out new ways of combining words, and of course, to find out where the gaps are in their knowledge. The drama activities give students an opportunity to strike a balance between fluency and accuracy.

REFERENCES

1. Allan C. Ornstein Loyola Univesity of Chicago. Strategies for Effective Teaching – 2010.
2. Allan C. Ornstein Loyola Univesity of Chicago. Effective Techiques for English Conversation Groups – 2010.

UDC 130.001

T. Chorna, English teacher
Kamyanets-Podilsky Industrial college

ABOUT LANGUAGE

The aim of the article is to explaine the importance of using drama techniques in teaching foreign languages. Drama attemps to put back some of the forgotten emotional content into language.

Most of us are familiar with the early stages of learning at least one foreign language. We may at certain times question, uneasily, the value of what we are learning; the language may seem irrelevant or artificial, the structures unwieldy, the vocabulary far-fetched. Yet we struggle on, saying «Son chapeau est sur la chaise» , «The pupils are opening their books» , or « Mein Bruder hat es mir gesagt» , in the belief that if the sentences are meaningful and correctly formed we must be learning something from them.

Much has changed in language teaching, but it is still true that the conviction that Vocabulary + Essential Structures = Language lies at the base of nearly every foreign language syllabus. Teaching in these lines takes account of only one aspect of the language – the intellectual aspect. But language is not purely an intellectual matter. Our minds are attached to our bodies, and our bodies to our minds. The intellect rarely functions without an element of emotion, yet it is so often just this element that is lacking in teaching material.

Many of the skills we most need when speaking a language, foreign or not, are those which are given least attention in the traditional text-book : adaptability (i.e. the ability to match one's speech to the person one is talking to), speed of reaction, sensitivity to tone, insight, anticipation; in short, appropriateness. The people we speak to during the day are not (thank goodness!) faceless citizens with conveniently pronouncable names like Brown and Grey, who rarely state anything but the obvious, and whose opinions are so bland as to gave neither offence nor pleasure. The people we meet are busy, irritable, worried, flustered, tired, headachy; their breath smells, their armpits itch, food gets stuck between their teeth; they have quirks and tics and mannerisms, they speak too slowly or too fast, repeat they are alive. And so are we. In order to talk to these people, we need to know who they are and who we are. We need to know whether the difference in our ages matters, whether we are likely to see them again, whether it is worth trying to influence them, whether they are likely to be helpful or difficult, etc. It is all very well to be able to produce statements like «Had we not told them, they would not have come», but the words mean nothing unless we know who «they» are and why this was said.

Drama attempts to put back some of this forgotten emotional content into language – and to put the body back too. This does not mean that we must studdenly start leaping about the room in an exaggerated fashion, but it does imply that we need

to take more account of meaning. Much language teaching is done through structures or so-called situations in the belief that once a sentence has been correctly formulated a use can always be found for it. First comes form, then meaning. This approach can be misleading, even dangerous, because it accustoms the learner to making sentences fit into structural moulds. To uae an analogy, such a learner is like an architect who designs a building before inspecting the site on which it is to be placed. There may be nothing structurally wrong with thd design, but if the building is five storeys high with a stone facade, and is intended to fill the gap between two steel-and-glass skyscrapers, the architect will clearly have to put in some overtime! Practically any sentence will have an abstract meaning – a propositional or dictionary meaning – but this face value may have nothing to do with its concrete use.

Let us consider a few examples. The much maligned example that used to crop up on the first page of all language text-books, «Is this a pen?», has now disappeared (we hope). And why? Not because it was incorrect or meaningless or useless, but because it was unnecessary and inappropriate. Try walking up to a London docker, taking a pen out of your pocket and asking him: «Is this a pen?» If he doesn't take a swipe at you he will most likely answer, «What the 'ell d'you take me for?» or, «Listen, mate, if you're looking fot trouble…» The question you asked was not understood as a question but as a provocation, which it was, for you were insulting him by suggesting he might not understand the self-evident. It is no less provoking to force the foreign language learner to go through the motions of answering inane questions simply because he or she has problems of vocabulary which the docker does not. It is not the question itself but the reason why it was asked that is at fault. After all, there is strusturally no evident difference between «Is this a pen?» and Macbeth's famous line, «Is this a dagger which I see before me?» The difference lies in the feeling. Macbeth asks a question to which he knows the answer, this is true; but he asks the question because he does not want to believe what he sees. He has, then, a strong reason for speaking as he does.

Meaning, therefore, should not be confused with structure. Commands are often given in the imperative, but not always; continuons action in the present may be suggested by a verb ending in -ing, but not always. Meaning slips from one structure to another in a most elusive way. Take an innocent statement such as, «It's eight o'clock». This might be, variously, a substitute order («Switch on the telly»), a concealed warning («You'd better hurry up, they'll be here in a minute»), a form of persuasion («Don't you think it's time we left?»), and so on. In all these examples the statement «It's eight o'clock» takes it's meaning from the intention of the speaker and his or her relation to the other person. To teach «It's eight o'clock as a response (and the only kind of response) to the question «What time is it?» is to place an unnecessary restraint on the language.

Correct structures do need to be taught, nobody would deny this, but can they not be taught meaningfully from the very start? Consider an obvious example: the present continuous tense. This is nearly always illustrated in class by the teacher

performing certain actions (opening a book, closing a window) and getting the students to reply to questions. Interest soon flags, because it seems pointless to describe what is going on it front of your eyes. Yet with a slight twist, the same actions can become interesting and the questions meaningful: all that is needed is that the observer should not know in advance why the actions are being performed. This is strikingly illustrated in two simple mime exercises : 3.17 What am I doing? and 3.18 The hotel receptionist. Drama, then, can help considerably by ensuring that language is used in an appropriate context, to matter how «fantastic» this context may seem.

We realize, of course, that like all other activities in the classroom, drama activities cannot be «real» simply because they are subject to the constraints the classroom imposes. Unlike more familiar activities, however, which always remain external to the student because imposed from without (and largely for the convenience of the teacher, not the student), these techniques draw upon precisely those internal resources which are essential for out-of-class use of the language.

REFERENCES

1. Allan C. Ornstein Loyola Univesity of Chicago. Strategies for Effective Teaching – 2010.

2. Allan C. Ornstein Loyola Univesity of Chicago. Effective Techiques for English Conversation Groups – 2010.

UDC 378:614.253.52

V. Dostav, Master student
O. Goray, PhD in Ped., research advisor
Y. Berezyuk, lecturer, language advisor
Zhytomyr Nursing Institute

THE FORMATION OF THE PROFESSIONAL SOCIO-PSYCHOLOGICAL NURSING COMPETENCE

The aim of this work is to analyze the professional socio-psychological nursing competence system.

The development of modern society and the process of reforming nursing education in Ukraine have essential changes in the area of interaction between patient and nurse. Nurses are also given new opportunities to train, to improve and play an integral role in leading change of health care system. Understanding these opportunities and taking into an account a global experience of implementing the nursing process in practice, we consider qualified masters-prepared nurses as a major item in performing individual socio-psychological training.

All the nurses need to possess basis competences to meet the demands of society with an emphasis on socio-psychological training. Some programs are working to incorporate these concepts into nursing education. Studying professional competence and continuous learning opportunities are essential items to a profession that is responsible for other's lives [1].

Effusive nursing practice requires the ability to recognize a model of social competence and handle responses in relationships with patients and their families. The research underlines the challenges nurses encounter when seeking to assess a student's development of emotional competence (psychological) during working with patients and training [2].

The research helps to build the scientific foundation for improved nursing education, including professional socio-psychological competence of nurses. The emphasis should be on quality and safety, evidence-based practice, reheard, leadership.

Objective: Working-out the training program of socio-psychological competence development, analyzing theoretical principles and practical approaches of the formation of professional socio-psychological nursing competency.

Tasks:

- to carry out theoretical and methodological analysis of the problem of social and psychological competences in medical and psychological, pedagogical literature;
- to determine the structure of the social and psychological competence of nurses;
- to examine the level of social and psychological competence of nurses its character in the course of professional training;
- to examine the model of socio-psychological competence of nurses;
- to test the effectiveness of the professional training of socio-psychological competence in high school;
- to work-out the program of socio-psychological competence development of nurses and to check its effectiveness.

The findings of the study indicate a need for definition of what competence is in nursing. It is argued that educators and practicing nurses must up hold the expectation that socio-psychological, emotional competence is a requisite ability and should themselves be able to role model emotionally competent communication [2].

Under the socio-psychological competence I. Yermakov understands the individual's ability to interact effectively with people in the system of interpersonal relationships and includes the ability to navigate social situations correctly, identifies personality traits and emotional state of others, chooses appropriate ways to communicate and implements them in the process of interaction between nurse and patient [3].

The factors connected with nurse competence need deeper exploring. Professional competence in nursing indicates sufficiency of knowledge and skills, responsibilities and requirements that enable someone to act in a wide variety of

situations. According to L. Lepikhova's opinion there is a list of the most important characteristics for effective professional activity:

- social intelligence;
- adaptation to social situations;
- personal flexibility;
- verbal understanding;
- personal strength;
- advanced leadership;
- confidence;
- life-long learning process;
- successful perform;
- professional mobility;
- left-regulation;
- personal growth [4].

The findings of study allow us to make the assumption that innovative education and training of competent nurses, and professional development contemporary instable circumstances play a significant role in the evaluation of socio-psychological nursing competence. It is necessary to upgrade nursing professional training at all levels of nursing education in Ukraine.

REFERENCES

1. Hassmiller. S. (2010). Nursing's role in healthcare reform. American Nurse Today, Vol. 5 No. 9.
2. Wilson, S. C., Carryer, J. (2008). Emotional competence and nursing education: A New Zealand study. Nursing Praxis in New Zealand, 24(1), 36- 47.
3. Єрмаков І. Педагогіка життєтворчості: орієнтири для XXI століття / І.Єрмаков // Кроки до компетентності та інтеграції в суспільство: наук.-метод. зб. [ред. кол. Н.Софій (голова), І.Єрмаков (керівн. авторськ. кол-ву і наук. ред.) та ін.]. - К. : Контекст, 2000. - С. 58-72.
4. Лєпіхова Л. А. Соціалізація та соціально-психологічна компетентність як рівні особистісної зрілості / Л.А.Лєпіхова // Кроки до компетентності та інтеграції в суспільство: науково-методичний збірник. – К.: Контекст, 2000. – С. 105 – 108.

UDC 355.018:615.851

A. Dyka, student,
Y .Kovalenko, English teacher, language advisor
Zhytomyr Nursing Institute

POSTTRAUMATIC STRESS DISORDER

"The army that fights, passes through a large number of people,
who after demobilization are plunged into civilian life,
bringing to it the peculiarities of militarized consciousness and
significantly impacting on the further development of society."
"Every war ends with peace"

The article deals with the notion of the battlefield medicine and its importance for the medical specialists in the conditions of modern war.

Our modern world is not quiet and calm, it is cold and disturbing. We all know and understand that the east of our country is suffering from the warfare. War. Pain. Despair. Tears. Death. These factors are harbingers of various diseases related to psychosomatic disorders.

History of the posttraumatic stress disorder. According to its symptomatic signs "Afghan" and "Chechen" symptoms are very similar to the "Vietnam" syndrome, which was first officially established by the American soldiers who returned home after the war in 60-70-ies of the 20th century. Due to the researches of american scientists, most soldiers returning from Vietnam, could not find their place in life. The reasons were not primarily of the material matters, but of socio-psychological terms: society, consciously or unconsciously has reft soldiers, who returned home being different people, with behavior different from other citizens [5].

"Donetsk" and "Lugansk" syndromes. ATO's experience showed that military psychologists on the front lines are not only necessary - their presence is required by commanders themselves. Military psychologist should be able to quickly "assemble" a fighter and orient for the battle. From the fighting spirit of the soldiers on the battlefield depends largely the success of operations against terrorism. Some soldiers are demoralized after shelling or injuries and deaths of their brothers and refuse to perform combat tasks and go back to the posts. With time former fighters of the ATO will necessarily want to displace the experienced in a very hard way, or to display the picture. One of the options - is the creation of criminal groups. Our main task is to prevent such a variant. The work is conducted in complex. Psychological help given to soldiers is divided into three stages. First is held in the recruitment of volunteers and mobilized. Here we need to determine: how effective the soldier will be in battle. The next stage is working with combat psychological injuries at the forefront. For example, a person has witnessed the death of his friend or fell into the condition when a soldier is non-contact and can "faint away" in the process of combat. The third stage is the necessary measures in rehabilitation centers or directly

at the military units. Due to the international standards soldiers cannot go straight home after the collisions. They must undergo at least a two-week rehabilitation, during which they may be visited by relatives and friends. But the soldier needs to change of scenery. Here the most important task for psychologists is to return person to society again, so that he could lead a normal life [3, p.276].

Psychologists on the battlefield. By the standards, proven in armies of many countries, the personnel should always be supervised by a psychologist and get the opportunity to undergo rehabilitation before returning to family. But not only soldiers but also psychologists suffer from the war. Of great importance is the first fight. It is the most dangerous. It depends on how the fighter will conduct it. It often happens that the first battle is not a direct confrontation, when you see the enemy, and the enemy sees you. For them it is important to survive and revenge, if there were dead, hit the enemy with fire - the basic things for war. Important for us is to support this military mind during the conflict and withdraw soldiers from this state after the ATO to introduce them back into the social life without any harm. Psychologists should prepare soldiers to that what they can see. What are the reactions to stress and what a combat injury can be. Psychologists must explain that the entire spectrum of reactions - is a normal feature of our psyche, with only some of the individual differences. Thus, the soldier can help his friend, who is unable to overcome panic, and to give the first psychological support. Now the psychologist profession has become necessary [1]. It is believed that "war syndrome" of the anti-terrorism operation will be much heavier than the "Afghan". The famous military psychologist Leonid Kitaev-Smyk called post-traumatic stress disorder the syndrome of revenge. The so-called "war syndrome" has much of shame and failure to achieve the desired result. The effects depend on what we get out of this conflict. The "Afghan" and "Vietnamese" symptoms were so severe, because they ended with depreciation and discrimination of those who participated in it. We have a war of liberation, we defend our independence. The degree of trauma will depend on the success of the campaign and justification of all victims, relation of state to the defenders, serious reforms in our country. To avoid this syndrome it is important how a society will meet those who returned from the front, and how will they help. People who returned from the front are hurt that they are psychologically not coincide with the life from which they came [4].

According to the director of the Military Medical Department of the Ministry of Defense of Ukraine Colonel of medical service Vitaly Andronatiy there will be created two rehabilitation centers in Ukraine for wounded. Already signed directives and established rehabilitation department at Lviv and Irpin hospitals. Volunteers are involved into creation of rehabilitation centers. "Ukrainian Association of overcoming the consequences of traumatic events" is provided with some space by the sponsors. This is mostly private houses in Kiev and Zhytomyr regions. But ATO involves tens of thousands of people. Volunteers have enough forces for the rehabilitation of 5-7 thousands of members, primarily the most injured [2, p.333].

Summary

Basic concepts of medical specialist training course for saving lives on the battlefield are reflected in medical rules such as actions aimed at the rehabilitation and correct psychologists' help on the battlefield. Due to all the above we propose to strengthen or introduce military training in psychology at the main bodies of infantry groups.

REFERENCES

1. American Psychiatric Association, Committee on Nomenclature and Statistics: Diagnostic and Statistical Manual of Mental Disorders, ed. 3, revised. Washington, DC, American Psychiatric Association, 1987.

2. Green У. L, Lindy J., Grace M., Gleser G. Multiple diagnoses in posttraumatic stress disorder: The role of War stressors // J. Nerv. Ment. Dis., 1989, 77, 329-335.

3. Horowitz M. J.,Weiss D. P.S., Marmar C. Diagnosis of posttraumatic stress disorder. //Nerv. Ment. Dis., 1987, 175, pp. 276-277.

4. Keane T. M " Zimering R. T., Caddell T. M. A behavioral formulation of PTSD in Vietnam veterans // Behav. Therapy 1985, 8, 9-12.

5. Pitman R., Orr P.S. P., Forgue D. F., Altman У., de Jong J., Herz L. Psycholophysiologic Responses to Combat Imagery of V. V. with PTSD versus Other Anxiety Disorders // J. of Abnormal Psichology, 1990, v. 99, 001 - 006.

UDC 612.914

N. Golownja, Bachelor student
M. Pristschepa, Sprachlehrerin
Medizinische Hochschule Schytomyr

FREMDSPRACHEN – SCHLÜSSELQUALIFIKATION FÜR DEN BERUF

Wenn der Mensch fließend verschiedene Sprachen spricht, hat er viele Möglichkeiten: er kann mit verschiedenen Menschen sprechen, sehr viel reisen und er eine Ausbildung im Ausland bekommt.

Die Motivation ist ein Handlungsantrieb; die Fähigkeit des Menschen seine Bedürfnisse auszufüllen.

Der Bedarf an Fachpersonal im pflegerischen und medizinischen Bereich ist in Deutschland in den vergangenen Jahren sehr stark angestiegen.

Aktuelle Studien zeigen, dass 2020 annähernd 56.000 Ärzte und gut 140.000 nicht ärztliche Fachkräfte fehlen.

Gleichzeitig gehen immer mehr Fachkräfte in den Ruhestand, ohne dass deren Stellen mit Nachwuchskräften besetzt werden können.

Der internationale Vergleich belegt, dass der Pflegebedarf in Deutschland besonders stark zunehmen wird, weil unsere Gesellschaft am stärksten altert.

Die Suche von geeigneten Fachkräften erfordert hohe Verwaltungskosten und kostet viel Zeit und Geld.

Die Lösung liegt im Anwerben ausländischer Fachkräfte und Personal. Actio Personalrecruiting unterstützt sie bei der Auswahl adäquater Kandidaten für medizinische und pflegerische Fachbereiche. Dabei legen wir großen Wert auf die fachlichen Kompetenzen, Berufserfahrungen, Anpassungsfähigkeit, psychische Belastbarkeit sowie ein hohes Maß an Motivation.

Das Lehrbuch ist ein Teil des breiten Lehrprozesses.

Die Zusammenlegung der verschiedenen Lehraspekte wurde der führende Punkt während der Gestaltung des Lehrbuches „Erfolgreich in der Pflege“.

Das Ziel des Grundkurses ist das zusammenfassende Studium aller Bildungstätigkeiten. Das Lehrbuch führt den Studenten in seiner zukünftigen Fachwelt ein: die Beschreibung der medizinischen Berufstätigkeit, der Fachwortschatz, die Grundlagen der Anatomie und Physiologie, die Beschreibung der Beschwerden der Patienten, die Untersuchungsmethoden, die Deontologie und die medizinisch-technische Geräte.

Es gibt ein System der internationalen Tests und Zertifikate, die das Leseverstehen, Hörverstehen, Schreiben und Sprechen einer Fremdsprache testet und das Sprachniveau bestätigt.

Der Gemeinsame europäische Referenzrahmen für Sprachen (GeR oder GeRS) bestehen aus 5 Stufen.

LITERATUR

1. Kommunikation in sozialen und medizinischen Berufen “Cornelsen” Verlag, Berlin, 2009.

2. Pluspunkte Beruf — Erfolgreich in der Pflege “Cornelsen” Verlag, Berlin, 2011.

3. Андронкина Н.М. Проблемы обучения иноязычному общению в преподавании иностранного языка как специальности / Н.М. Андронкина // Обучение языкам в школе и вузе. – СПб.: Изд-во РГПУ, 2001. – С. 136-139.

4. Клюев Е.В. Речевая коммуникация / Е.В. Клюев: учеб. пос. – М.: РИПОЛ КЛАССИК, 2002. – С. 208-216.

5. Пассов Е.И. Коммуникативный метод обучения иноязычному говорению / Е.И. Пассов.— М.: Просвещение, 1985. – С. 101-107.

6. Сунцова Е.Н. Выбор методов обучения студентов неязыкового вуза иностранному языку в условиях ограниченности учебного времени/ Е.Н. Сунцова // Молодой ученый. — 2011. — №1. — С. 232-234.

UDC 61(09):001.8

A. Grishchak, medical assistant
N. Serderga, language advisor
Zhytomyr Nursing Institute

THE FUTURE OF MEDICINE

The future of medicine is really exciting: science fiction is becoming real. The purpose of my article is not only to tell about the importance of the experimental medicine at the present time, but also to show that it is a necessary part of any medical specialist's training. So this article shows you the latest medical researches.

Nobel Prize for anti-parasite drug discoveries.

The Nobel Prize for physiology or medicine has been split two ways for groundbreaking work on parasitic diseases.

William Campbell and Satoshi Omura found a new way of tackling infections caused by roundworm parasites.

Youyou Tu shares the prize for her discovery of a therapy against malaria.

The Nobel committee said the work had changed the lives of hundreds of millions of people affected by these diseases.[1]

Nobel Prize for the brain's GPS discovery.

The Nobel Prize for physiology or medicine has been awarded to three scientists who discovered the brain's "GPS system".

UK-based researcher Prof John O'Keefe as well as May-Britt Moser and Edvard Moser share the award.

They discovered how the brain knows where we are and is able to navigate from one place to another.

Their findings may help explain why Alzheimer's disease patients cannot recognise their surroundings.[2]

Cellular 'shipping' wins Nobel Prize.

Three scientists have won the Nobel Prize for medicine or physiology after discovering how cells precisely transport material.

James Rothman and Randy Schekman, both from the US, and Thomas Sudhof, from Germany, shared the prize.

They found the way "vesicles" act like a fleet of ships transporting their goods to the exact destination.

It is crucial for the way the brain communicates, the release of hormones and parts of the immune system.[3]

Gurdon and Yamanaka share Nobel prize for stem cell work.

Two pioneers of stem cell research have shared the Nobel prize for medicine or physiology.

John Gurdon from the UK and Shinya Yamanaka from Japan were awarded the prize for changing adult cells into stem cells, which can become any other type of cell in the body.

Prof Gurdon used a gut sample to clone frogs and Prof Yamanaka altered genes to reprogramme cells.

The Nobel committee said they had “revolutionized” science.[4]

Immune pioneers share Nobel prize for medicine.

Three scientists who “revolutionized” understanding of how the body fights infection have shared this year's Nobel prize for medicine.

Bruce Beutler, of the US, Jules Hoffmann from France and Ralph Steinman from Canada all shared the prize.

Profs Beutler and Hoffman discovered how the body's first line of defence was activated.

Prof Steinman discovered the dendritic cell, which helps defeat infection.[5]

“Father of test tube baby” wins Nobel Prize for medicine.

The “father of the test tube baby,” Robert G. Edwards, won the Nobel Prize for medicine on Monday, the awards committee announced.

His contributions to developing in vitro fertilization (IVF) “represent a milestone in the development of modern medicine,” the committee said.

“As early as the 1950s, Edwards had the vision that IVF could be useful as a treatment for infertility,” which affects about 10 percent of all couples worldwide, the committee said.

A test that finds 3x more breast tumors, and why it's not available to you. Working with a team of physicists, Dr. Deborah Rhodes developed a new tool for tumor detection that's 3 times as effective as traditional mammograms for women with dense breast tissue. The life-saving implications are stunning. So why haven't we heard of it? Rhodes shares the story behind the tool's creation, and the web of politics and economics that keep it from mainstream use.

A needle-free vaccine patch that's safer and way cheaper

One hundred sixty years after the invention of the needle and syringe, we’re still using them to deliver vaccines; it’s time to evolve. Biomedical engineer Mark Kendall demos the Nanopatch, a one-centimeter-by-one-centimeter square vaccine that can be applied painlessly to the skin. He shows how this tiny piece of silicon can overcome four major shortcomings of the modern needle and syringe, at a fraction of the cost.[8]

Medicine’s future? There’s an app for that

Daniel Kraft offers a fast-paced look at the next few years of innovations in medicine, powered by new tools, tests and apps that bring diagnostic information right to the patient's bedside.[6]

Synthetic voices, as unique as fingerprints

Many of those with severe speech disorders use a computerized device to communicate. Yet they choose between only a few voice options. That's why Stephen

Hawking has an American accent, and why many people end up with the same voice, often to incongruous effect. Speech scientist Rupal Patel wanted to do something about this, and in this wonderful talk she shares her work to engineer unique voices for the voiceless.[8]

A bold new way to fund drug research

Believe it or not, about 20 years' worth of potentially life-saving drugs are sitting in labs right now, untested. Why? Because they can't get the funding to go to trials; the financial risk is too high. Roger Stein is a finance guy, and he thinks deeply about mitigating risk. He and some colleagues at MIT came up with a promising new financial model that could move hundreds of drugs into the testing pipeline.[7]

A test for Parkinson’s with a phone call

Parkinson’s disease affects 6.3 million people worldwide, causing weakness and tremors, but there's no objective way to detect it early on. Yet. Applied mathematician and TED Fellow Max Little is testing a simple, cheap tool that in trials is able to detect Parkinson's with 99 percent accuracy — in a 30-second phone call.[8]

In conclusion, we must say that these researches are important not only for medicine. Moreover, they constitute a tremendous contribution to world science.

REFERENCES

1. BBC news. 5 October 2015. By Michelle Roberts, Nobel Prize for anti-parasite drug discoveries. http://www.bbc.com/news/health-34441744

2. BBC news website. 6 October 2014. By James Gallagher, Nobel Prize for the brain's GPS discovery. http://www.bbc.com/news/health-29504761

3. BBC news. 7 October 2013. By James Gallagher, Cellular 'shipping' wins Nobel Prize.http://www.bbc.com/news/health-24427951

4. BBC news. 8 October 2012. By James Gallagher, Gurdon and Yamanaka share Nobel prize for stem cell work.http://www.bbc.com/news/health-19869673

5. BBC news. 3 October 2011. By James Gallagher, Immune pioneers share Nobel prize for medicine.http://www.bbc.com/news/health-15149257

6. World Health Organization: WHO. http://www.who.int/en/

7. PLOS Medicine. http://journals.plos.org/plosmedicine/

8. https://www.ted.com/playlists/23/the_future_of_medicine

UDC: 81'243:371.315

V. Koshkalda, Master student
O. Misechko, Doctor of Education, Prof., research advisor
O. Bashmanivskiy, PhD in Education, As. Prof., language advisor
Ivan Franko Zhytomyr State University

EDUCATIONAL POTENTIAL OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES

The emergence and development of information society led to widespread usage of information and communication technologies (ICT) in education, that is determined by many factors. Thus, introduction of ICT in modern education significantly accelerates the transfer of knowledge and accumulated human experience (technological and social).Modern ICT provide opportunities for successful and quick adaptation to the environment and to social changes. Active and effective implementation of these technologies in education is an important factor of a creating a new education system, that meets the requirements of the information-abundant society and of the modernization of the traditional education system. The aim of this study is to stress a powerful educational potential of modern ICT.

Modern information and communication technologies as a teaching tool allow to fulfill a number of didactics, pedagogical, methodical and psychological principles. They make learning more interesting and creative because of its complexity, interactivity and versatility. From the point of its didactic value, ICT help to make studies more intensive, effective, independent and creative; provide feedback in this process; design the probed processes or phenomena; organize collective and group work. The use of ICT may be appropriate at all stages of the lesson both in natural and mathematical disciplines and in humanities.

The most widespread ways to use ICT at school according to I.Stavitska are:

- use of electronic lecturers, trainers, textbooks, encyclopedias;
- design of processes and phenomena;
- providing the distance education;
- organizing interactive educational teleconferences;
- construction of the system for controlling or checking students' skills and knowledge (usage of the controlling software tests);
- creation and support of schools websites;
- support of students' research activity;
- creating presentations of educational material, etc[2].

Information and communication technologies are a powerful tool for the reception of various information by students and an effective teaching tool that increases interest and allows to implement the principle of clarity.

Unfortunately, today the provision of secondary schools with computers and programs in Ukraine is unsatisfactory and the teachers' level of computer literacy is

mostly not equal the technological achievements of our time. Ukraine takes one of the last places as for the amount of computers in secondary schools - 1.3computers per 100students. For comparison: in Japan there are 82computers per 100 students, in the USA – 76, in Germany – 52, in France – 38, in Poland – 14.6, in Russia – 10.4.Over 1 million students (about 20 percent) study in schools without modern computers at all. Today, according to the index of «readiness of informative infrastructure» Ukraine occupies a 82nd place among 104 countries of the world, next to Zambia and Tanzania. Rural schools in Ukraine have 9 computers per institution, on the average, by comparison to 22 computers per one school in middle-sized town and 28 in large cities. There are less than 2% of such schools in large cities[1].

Development of the information-abundant society determines priority routes of education. They are:

- to improve the content and form of the educational process according to the possibilities of modern ICT;
- to provide ICT in the sphere of education;
- to create and implement a new computer methods of training and testing;
- to prepare professionals and teachers to use a variety of ICT;
- teach students to use information and communication technologies correctly;
- to create conditions for a stage-by-stage transition to a new level of education based on these technologies;
- to form and develop intellectual potential of the nation.

Educational reforms are impossible without regulative changes in this sphere . The Ukrainian legislation has already created a number of programs and concepts aimed at informatization of education. For example:

- 1998 - "The concept of the National Informatization Program" which started regulatory and regulatory logistics in the sphere of informatization of Ukraine;
- 2005 - Program "Information and communication technologies in education and science";
- 2007 - Law of Ukraine "On the Fundamentals of Information Society Development in Ukraine for the period of 2007-2015";
- 2010 - The concept of the state target program "One hundred percent" for the period until 2015 (2010) (the order approving the concept was invalidated prematurely (05/03/2014) because of budgetary savings).

After analyzing educational processes in Ukraine, we can conclude that a period of decisive changes of traditional views on education has come. Computerization has strengthened its position of an important component and tool of reforming education, as far as without this process the level of education cannot be upgraded. The introduction of ICT in the learning process is a stable and very important trend of modern education, it aims to prepare the individual for life in the information-abundant society (development of communication skills, research skills, skills to work with information). The use of ICT on lessons opens the great

opportunities before a teacher in the formation of the subject competence, interest and stable cognitive activity of students .Computers must be present in all educational class-rooms, not only at the lessons of informatics, because the computer has already been used not only as an object of study but also as a means of helping to organize the learning process.

REFERENCES

1. Самохін І. Проблеми шкільної освіти мовою цифр [Електронний ресурс]. Режим доступу до статті: http: //osvita.ua/school/49694/

2. Ставицька І. В. Інформаційно-комунікаційні технології в освіті [Електронний ресурс]. Режим доступу до статті: http://confesp.fl.kpi.ua/node/1103

UDC 614.39:614.2253.52:173.7+173.3

K. Kostrytsya, bachelor student
A. Ryzhenko, Prof. of obstetrics and gynecology
Zhytomyr Nursing Institute

THE ROLE OF THE NURSE IN THE PREVENTION OF COMPLICATIONS DURING PREGNANCY IN CONGENITAL HEART DISEASE WOMEN

Key words: congenital heart disease, childbirth, pregnancy, the role of nurse, patient.

Actual topics: Management of pregnancy in women with heart disease is the art that requires joint coordinated efforts of obstetrician-gynecologist and cardiologist or therapist. A significant role in the prevention of complications in this pathology is provided by nurse. The nurse should carry the direct work with pregnant, to give women advice about the right schedule of the day, food, because pregnancy makes demands to the cardiovascular system of the expectant mother. This is due to changes which are caused by coexistence of two organisms—the mother and fetus.

Referring to the combination of heart and vascular disease and pregnancy it should be noted that pregnancy and caused it circulatory changes, metabolism, body weight (increase of 10 to 12 by the end of pregnancy), water salt metabolism (during pregnancy the total content of water in the body increased by 5-6 liters, the content of sodium in the body increases at the tenth week of pregnancy doubled) require heavy heart work and often aggravate the course of cardiovascular disease. All these changes are due to the fact that pregnant woman has an additional uterine placental circulation. And accordingly changing heart load. These load increases depending on the type of heart disease and how heart copes with the assigned task. Congenital heart disease are divided into three groups:

-Vices drop of blood from right to left. These includes nonunion defects of atrial and inter ventricular septum (through holes occur incorrect blood switch) and ductus arteriosus.

-Vices drop of blood from left to right. Transposition (moving) of great (main) vessels.

-Vices with blood flow interference. (narrowing of major blood vessels).

The research aim: explore the peculiarities of pregnancy, childbirth, early postpartum women who suffer from congenital heart disease.

Objectives of the study:

1. to carry the analytical overview of the literature through this problem.
2. to examine statistics on the number of pregnant women with congenital heart disease.
3. to prove the promising approaches to the nurse activity for more effective management of pregnancy in women with congenital heart disease.

Research methods: system analysis and logic synthesis, clinical and statistical.

Results and discussion. One of the most severe extra genital pathology in pregnant women is cardiovascular diseases and the main among them are heart disease. Pregnant women with heart disease refer to the high risk maternal and perinatal mortality group. This is because pregnancy puts on an additional burden on the cardiovascular system of the woman.

Pregnancy is rather a dynamic process and thermodynamic changes in hormonal status and many other physiological factors are constant and gradual and sometimes sudden in the organisms of the pregnant woman. Therefore it is important not only to diagnose correctly, define nosology form of heart disease and vessels, but to estimate the etiology of the this disease and functional state of the cardiovascular system. In addition it is important to evaluate the degree of primary pathological process (rheumatism, rheumatoid arthritis, thytotoxicosis etc) that led to the defeat of the cardiovascular system and detection of focal infection (cholecystitis, tonsillitis, tooth decay etc) and other accompanying diseases. So complex but in the majority of cases solved problems face the doctor which decides if the woman which suffer from a certain cardiovascular disease can have a pregnancy and childbirth without risk to her health and life and the life of the future child.

Conclusion: The question of permissibility to have pregnancy and childbirth for woman suffering cardiovascular diseases must be decided in advance, ideally before marriage. The doctor has some advantages in this issue carrying out clinical observation of patients and also the doctor who constantly monitors the patient (a district doctor, a family doctor, cardiologist). Moreover in case of pregnancy, childbirth and postpartum this issue should be resolved together with the cardiologist and obstetrician gynecologist if necessary involving the other doctors.

REFERENCES:

1. Гайдаєв Ю.О., Коваленко В.М., Корнацький В.М. та ін. Стан здоров'я населення України та забезпечення надання медичної допомоги: Аналітично-статистичний посібник. – К., 2013. – 97 с.
2. Гайдаєв Ю.О., Корнацький В.М. Проблеми здоров'я та напрямки його покращання в сучасних умовах // Український кардіологічний журнал. – 2010. – № 5. – С. 12–16.
3. Дудко В.В. Серцеві захворювання.– М.: Практика, 2010.– 319с.
4. Коваленко В.М., Корнацький В.М. Демографія і стан здоров'я населення України (Аналітично-статистичний посібник) / В.М. Коваленко, В.М. Корнацький. – К., 2013. – С.45.
5. Медсестринство в терапії: Підручник/За заг. ред. М.І. Шведа, Н.В. Пасєчко. – Тернопіль: Укрмедкнига, 2010. – 546 с.
6. Сайт державної служби статистики України. Режим доступу: www.ukrstat.gov.ua.

UDC 614.253.52:01

O. Krasnozhon, Medical Assistant Department student
N. Shygonska, PhD in Ped., As. Prof., research advisor
N. Shygonska, PhD in Ped., As. Prof., language advisor
Zhytomyr Nursing Institute

THE RISKS OF TRANSFUSION-TRANSMITTED INFECTIONS

A blood transfusion is the transfer of blood or blood products from one person (donor) into another person's bloodstream (recipient). This is usually done as a lifesaving maneuver to replace blood cells or blood products lost through severe bleeding, during surgery when blood loss occurs or to increase the blood count in an anemic patient.

Blood can be provided from two sources: autologous blood (using your own blood) or donor blood (using someone else's blood).

WHAT IS THE INFECTION RISKS OF AND COMPLICATIONS OF A BLOOD TRANSFUSION?

The use of greater amount of red blood cells is associated with a high risk of infections. In those who were given red blood only with significant anemia infection rates were 12% while in those who were given red blood at milder levels of anemia infection rates were 17%.

On rare occasion, blood products are contaminated with bacteria. This can result in life-threatening infection, also known as transfusion-transmitted bacterial infection. The risk of severe bacterial infection is estimated, as of 2002, at about 1 in 50,000 platelet transfusions, and 1 in 500,000 red blood cell transfusions. Blood

product contamination, while rare, is still more common than actual infection. The reason platelets are more often contaminated than other blood products is that they are stored at room temperature for short periods of time. Contamination is also more common with longer duration of storage, especially when exceeding 5 days. Sources of contaminants include the donor's blood, donor's skin, phlebotomist's skin, and from containers. Contaminating organisms vary greatly, and include skin flora, gut flora, or environmental organisms. There are many strategies in place at blood donation centers and laboratories to reduce the risk of contamination. A definite diagnosis of transfusion-transmitted bacterial infection includes the identification of a positive culture in the recipient (without an alternative diagnosis) as well as the identification of the same organism in the donor blood.

Since the advent of HIV testing of donor blood in the 1980s, the transmission of HIV during transfusion has dropped dramatically. Prior testing of donor blood only included testing for antibodies to HIV. However, due to latent infection (the "window period" in which an individual is infectious, but has not had time to develop antibodies), many cases of HIV seropositive blood were missed. The development of a nucleic acid test for the HIV-1 RNA has dramatically lowered the rate of donor blood seropositivity to about 1 in 3 million units. As transmittance of HIV does not necessarily mean HIV infection, the latter could still occur, at an even lower rate.

The transmission of hepatitis C via transfusion currently stands at a rate of about 1 in 2 million units. As with HIV, this low rate has been attributed to the ability to screen for both antibodies as well as viral RNA nucleic acid testing in donor blood.

Other rare transmissible infections include hepatitis B, syphilis, Chagas disease, cytomegalovirus infections (in immunocompromised recipients), HTLV, and Babesia.

ARE THE ALTERNATIVES TO BLOOD TRANSFUSSION?

Researchers are trying to find ways to make blood. There's currently no man-made alternative to human blood. However, researchers have developed medicines that may help do the job of some blood parts. For example, some people who have kidney problems can now take a medicine called erythropoietin that helps their bodies make more red blood cells. This means they may need fewer blood transfusions.

Surgeons try to reduce the amount of blood lost during surgery so that fewer patients need blood transfusions. Sometimes they can collect and reuse the blood for the patient.

REFERENCES

1. Maresch C, et al. Residual infectious disease risk in screened blood transfusion from a high-prevalence population: Santa Catarina, Brazil. Transfusion, 2008, 48(2):273–281.

2. WHO Global Database on Blood Safety, 2004–2005 report. Geneva, World Health Organization, 2008.

UDC 614.253.52:01

L. Kravchyk, Master student
V. Shatylo, Doctor of Medicine., Prof., research advisor
N. Shygonska, PhD in Ped., As. Prof., language advisor
Zhytomyr Nursing Institute
Zhytomyr Regional Children's Hospital

NURSING MANAGEMENT WITHIN MULTI-FIELD HOSPITAL

Introduction. The modern healthcare system is in the process of permanent changes and reforms in Ukraine. These processes demand creating a qualitatively new approach concerned nursing care and management. Thus, hospital management enables its staff to use effective technologies in medical practice.

Objective. The objective of the paper is to analyze the world experience of nursing management.

Results and discussion. The problems of nursing management were considerably researched in the works of world-known and Ukrainian medical practitioners and scientists: M. Mecson, V. Shatylo, O. Bajieva [1] who identified main problems of this process in the world and Ukrainian Health Care systems, in particular. Among ones that need revision are: legislative background, new specializations, educational standards, medical standards and professions – Health Care Managers.

Conclusions. The existing Healthcare system in Ukraine is to great extend based upon nursing practice along with the doctorial one. But the growing role of nursing management contributes to the efficiency of its functioning and development. So, training new specialists and upgrading legislative background will contribute to the process of the system renewing and progress.

UDC 614.39:614.2253.52:173.7+173.3

T. Krugla, chair "Nurse business"
V. Svyrydyuk, Doctor of Medicine, Prof., scientific advisor
Zhytomyr Institute of Nursing, Zhytomyr city, Ukraine

FAMILY CONFLICTS AND MOTHER'S ROLE IN THEIR PREVENTION AND SETTLEMENT

Topicality of the subject: Family relations as one of the most significant sector in the operation of the society were always in the centre of researchers' attention. The

interpersonal attitudes of the parents and the children at the juvenile age are the most important ones.[1,p.283; 4, p.298-300]

Objective of the work, to determine typical purposes of the mother's role among female individuals of three generations; grandmothers, mothers and daughters in regard to prevention and settlement of the family conflicts.

For the goal achievement the test PARI by E. Schaefer, R.Bell was used by us. We tested 120 female individuals. Among them: 40 students of the course of Zhytomyr Institute of Nursing who were a group of daughters by the age, 80 nursing practitioners of Zhytomyr region who were divided into two groups by the age and the family status: mothers and grandmothers.

Obtained results. The strategies of the mothers, grandmothers and daughters' behavior were determined according to a top priority which the interviewers chose. Grown-up married women who have got children and grandchildren (grandmothers) made partner relations as the most appropriate and acceptable a top priority. Grown-up married women who have got children but have not got grandchildren yet (mothers) made partner relations in the marriage number two and feeling of man's apathy towards the family problems number one. Unmarried teenage girls at the age of 15-17 made the self-sacrifice a top priority whereas they made the strategies of partner relations number seven. Besides exaggerated subjective feeling of the man's apathy towards the family problems, the married nurses (mothers) demonstrated such unacceptable strategies of the behavior in the family as the inclination to conflict behavior and to oppression of the other family members' will, they made them number two and number three priority.

Conclusion.

1. That is nurses' nature to have adequate understanding of a mother's role in prevention and settlement of family conflicts.
2. The nurses' strategies of the behavior as regards prevention and settlement of family conflicts are differed depending on interviewers' age and their family status.
3. Grown-up married nurses overrate the man's role in the family, they make high demands of him demonstrating the inclination to conflicts and oppression of the other family members' will at the same time. Under such combinations of the strategies the family conflicts are unavoidable. So married nurses need to have more tolerant attitude to the other family members.
4. On the contrary, teenage girls need to enhance the self-esteem so that partner relations will be changed into the inclination to the self-sacrifice.

REFERENCES

1. Battered women's experiences in the emergency department. /Campbell J.C, Pliska M.J, Taylor W., Sheridan D.J //Emerg Nurs. 1994. -20. –P. 280–288.

2. Physical health consequences of physical and psychological intimate partner violence. /A.L.Coker, P.H.Smith, L.Bethea /Arch. Fam. Med. -2009. -№9. –P. 451–457.

3. Straus M. A. Conflict tactic scales. In: Fredman N, Sherman R. Handbook of Measurements for Marriage and Family Therapy. -New York, NY: Brunner/Mazel, 1987. -452 p.

4. Violence against women: provider barriers to intervention in emergency departments. /McGrath ME, Bettacchi A, Duffy SJ, Peipert JF, Becker BM, St Angelo L. //Acad Emerg Med. 1997; 14. –P. 297–300.

UDC 378:614.25352

V. Kucheruk, BA student (Bachelor student)
S. Poplavska, PhD in Pedagogic, research advisor
As. Prof. of Natural Sciences Department,
Social Sciences and Humanities,
N. Shygonska, Ph.D. in Pedagogic Sciences,
As. Prof. of Nursing Department, language advisor
***Head of* academic laboratory**
Zhytomyr Nursing Institute

DEVELOPING COMMUNICATIVE CULTURE AT FUTURE NURSES MEDICAL STAFF

Educational policy is a very significant developmental strategy of the health care industry. The level of training of medical personnel depends not only on the formed professional skills but also on the communicative culture. Deneral characteristic feature of communicative culture is its moral orientation and moral culture worker is disclosed during the communication process.

The communicative culture is perceived as totality of knowledge about a commonunication in various terms and with different participants [2, p. 92]. The development of such culture at future health workers involves the posession of verbal abilities and skills, and the knowledge of standarts and rules of communication. The content of medical workers' communication is conveyed through the verbal and nonverbal contacts. While talking to the patient, medical staff must take into account his psychological and physical condition be calm and friendly.

Communicating with patients, their relatives, close friends, medical specialists primarly affects them not by the content of the information but by the way how this information is presented, i.e. by the communicative culture. The role of communication is particularly important in the process of formation of professional

ethics and culture, because it is the basis of both professional and personal skills of medical workers [1, p. 51].

Conclusion. The knowlegde of communication, at its culture patterns, functions, mutual exchange and issues, form the basis of implementing and improving the relations between and patients, as well as the satisfaction of their needs.

REFERENCES

1. Зеліско Л. Культура як складова професійної підготовки особистості / Любов Зеліско // Педагогіка і психологія професійної освіти. — Львів, 2009. — №4. — С. 51—62.

2. Поплавська С. Д. Модель формування готовності студентів медичних коледжів до комунікативної взаємодії у професійній діяльності / С. Д. Поплавська // Вісник Житомирського державного університету імені Івана Франка. – 2009. – Вип. 46. – С. 92–96.

UDC 101.9

A. Liashuk, 4th year student
N. Zoshchuk, PhD in Phil., Senior Lecturer, language advisor
National University of Water and Environmental Engineering

THE SEARCH FOR HUMAN HAPPINESS: BETWEEN TWO FIRES

The aim of this study was to investigate human feelings and find the core of man's happiness. Every person was born for a happy life. For some people it is measured by the amount of money but for others it in glory; for someone it is in wisdom and knowledge, and for someone it is important to love and to be loved. Whose choice could be right? Is love is a major factor of happiness? To be happy requires confidence and to be in love needs just uncertainty. Happiness is based on peace, love, doubts, and anxiety.

In the history of philosophical thoughts on love and its meaning and purpose in history there is special role belonged to philosophers XVIII-XIX centuries. Immanuel Kant was convinced that love plays a leading role in the destiny of man because 'when it comes to duty not just the idea of it'. Erich Fromm's in the 'The Art of Love' emphasizes this same idea in this book.

We cannot abandon the happiness. Most people are not lucky. They like each other but do not fall in love or fall in love, but they have nothing to say to each other. We all are just nothing because we do not know what we want and where we are going.

According to Aristotle, only the constant pursuit of happiness for himself can result in perfect happiness that is 'happiness for happiness'. However, for a man to reach the greatest happiness means the state of the soul. The state of the soul is the

essence of life. Therefore, life is the supreme happiness. Peak della Mirandala considers happiness as well as physical concepts. He divides it into ‘natural’ and ‘supernatural’. The first is achieved by self-improvement (*actually, I think it is a real step of happiness*). The second is a return to God. One without the other is impossible, according to Mirandally.

Thus, the enhancement of his personality is happiness. Fortunately, we cannot know its structure. It is just impossible. This is an enormous content of human mind. Although there is an opportunity that simply does not exist.

Ukrainian philosopher G. Skovoroda tried to find a formula of happiness that would help humanity in this mission. In the fable ‘Kukushka Kosik’ he proved the idea of happyness as a supreme feeling of the soul. ‘Know themselves’ is purpose of worldwide thought in the artistic heritage of the thinker. He raised and developed further the idea of ‘know himself’ put forward by the Greek Socrates and Plato.

The natural outcome of philosophy and life objectives G. Skovoroda has developed further in his theory of happiness. Happiness he considers first as a condition of independence and relaxation of mind that is achieved by releasing the pressure in overcoming the world and restless passion, ill will within the person. Happiness is fun, it is a manifestation of ‘Healthy harmonic soul’. True happiness may be ‘property’ of every person.

Moreover, modern ethics in order to achieve happiness underlines the following:

-The satisfaction of basic material needs;

-completeness and meaningfulness of human existence;

-The ability of humans to realize their own idea of living in situations of moral choice;

-Harmony man's inner world and its external relations.

-Ethics happiness cannot be built on a peremptory basis. However, at the moment we can still hear different opinions.

The researcher J. Lubbock formulated his views on the nature of happiness: ‘There is not only the duty of happiness, and happiness and duty’; his obligation derives in particular from the fact that a man when he is happy promotes the same happy being of others.

Life of a typical TV show, alternating scenes that described in the same scenery, with the participation of almost the same characters, and the next series is always looking forward.

The strongest love is without an answer. I would rather not ever know, but this is true that there is nothing worse than to love someone who does not love you, and at the same time, there is nothing more beautiful than this. To love someone who loves you is narcissism. To love someone who loves you not that is love. You need to understand one thing that everyone should have something elusive. You should try to understand the phrase by Camus: ‘We must imagine Sisyphus happiness’. He wanted to stress that people during their life are doing the same stupid things, but it is possible and they are happy.

Epicurus calls life as a life of one day. It is completing of a simple pleasure. The best way not regretting about anything is to try to forget.

After all, happiness is simple. It is someone's face. It is known that 558 types of human societies are monogamous 24%. Most polygamous species. About aliens and say nothing: Galactic Charter H23 long been banned on all planets monogamy. The biggest problem of human life is suffering which you have experienced and the most sophisticated philosophy can justify a man who is indifferent in attitude to heart that loved her.

In the twenty-first century love is a phone that does not ring. The truth is that love begins with roses and ends with thorns. We can keep yourself in good shape and in good spirits.

To conclude, to become happy we must undergo terrible state of unhappiness. If you do not feel grief, happiness cannot be strong. Love lives long, only if each of the couple knows the price of it and better pay in advance.

REFERENCES

1. Ф. Бегбедер. Любовь живет три года / Бегбедер Фредерик. – М. : Иностранка, Азбука-Аттикус, 2013.- 192с.
2. Ерiх Фром – Мiинск: Творческо-производственний центр «ПОЛИФАКТ», 1991. – 230 с.
3. Klein K. On fire: Charismatic leadership and levels of analysis / K. Klein, R. House. // The Leadership Quarterly. – 1995. – №6. – С. 183–198.

UDC 614253.52:6162-053.5-084

A. Matviychuk– division student
"Nurse bachelor" (present work)
Natalia Duzhytch - the lecture of discipline
`Nursing in pediatrics`
Natalia Eremeeva– language advisor
Zhytomyr Nursing Institute

PECULIARITIES OF RESPIRATORY DISEASE WITH SCHOOL AGE CHILDREN AND THE ROLE OF THE NURSE IN PREVENTION

Actual topics: Respiratory disease is the most frequent pathology in children, because every two children of three, whose parents go to the pediatric have a respiratory diseases. The structure of the causes of child mortality by respiratory diseases takes 3d place followed with perinatal pathology and congenital malformations. According to WHO 2,2 million people die worldwide from ARVI every year. Currently the respiratory disease in children of Ukraine is about 5000 to 1000 per year although the frequency of the reference is 1000-2000 to 1000.

The research aim: to identify the peculiarities of respiratory diseases in the schoolchildren.

Due to the unfavorable ecology the respiratory diseases cause greater changes in the immunity, especially in children with immature immunity reactions and anomalies of the constitution. The structure of the causes of child mortality by respiratory diseases takes 3d place followed with perinatal pathology and congenital malformations. At the same time according to the virologists acute respiratory viral infections among the children up to three years occur 2 to 12 times in a year (the maximum incidence is on the second and third year due to the socialization of the child, the contact with more people both children and adults), among the children from three to seven years occur 6 times in a year and among the children from 7 to 17 years occur 3 times in a year. On average from birth to high school graduation children suffering ARVI 60 times. During the next 17 years period the adult is usually suffer ARVI once a year. The children diseases as adults can occur without symptoms or asymptomatic.

Conclusion: Respiratory diseases occur more often and proceed more difficultly in children than in adults with more rapid development of respiratory failure which is connected both with the anatomical and physiological characteristics of the respiratory and with features of reactivity of the child's body that's why the development of effective prevention and treatment recommendations for patients with disorders of the respiratory system especially schoolchild is a major in the nurses and requires constant support and understanding of the importance of the problem by the society and the state.

REFERENCES

1.В.Н., Аряев Н.Л. Охрана здоровья матери и ребенка в практике семейного врача. – Київ, „Здоров'я", 2013.

2. Майданник В.Г. Основи клінічної діагностики в педіатрії. - К., 1998. - С.34-73.

3. Нечитайло Ю.М., Сорокман Т.В., Тимощук В.В. Дихальна система у дітей. Навчальний посібник для студентів та лікарів-інтернів.- Чернівці, 2001.- 54 с.

UDC 327.56

I. Moroz, Bachelor student
V. Zahurska-Antoniuk, PhD in Political Science, As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

GEOPOLITICAL POSITION OF UKRAINE IN MODERN WORLD

The thing that is understood now as geopolitics has been existing since ancient times. However, the object of the research didn't have its own name. The term *geopolitics* was only put forward by a Swedish scientist Rudolf Kjellén in 1916. He understood it as a doctrine that considers a state to be a geographical organism or a space phenomenon.

The political events of the 20th century rapidly made this young discipline very popular.

After World War II geopolitics took on some new meanings: 1) a synonym for a geostrategy in solving specific foreign policy and military strategic objectives; 2) an equivalent of political geography to explain a zonation of both regional and global processes.

Traditionally geopolitics is viewed as a study about an impact of geographical space of states on their political goals and interests. Today it is interpreted more broadly as a study about relations and interactions of geographical space and politics.

According to Saul Cohen's model of geostrategic areas and geopolitical regions, Ukraine belongs to the category called *Gateways* that will play a role of leaders in communication between states stabilizing the geopolitical system of the world. *Gateways* are usually situated along the borders of geostrategic areas. The author of the model believes that in the process of becoming an independent geopolitical unit, a *Gateway*, as a conflict zone, turns into a zone of compromise development [2].

George Friedman, an American political scientist, forecasts geopolitical changes that may occur in the 21st century deeply analyzing current trends [3].

The USA seems weak now, but it is an illusion. American power is so great that the next hundred years will be the period of absolute rule of America. And the peak of it will be at the end of the 21st century. Weak-willed Europe will lose its importance, and Chinese growth will appear to be a soap bubble that will burst soon.

The new stars like Japan, Turkey, Poland and Mexico will shine in the geopolitical sky.

Russia will gradually restore its control over the post-Soviet space not through the mobilization, but due to special operations in 2020s. But right after that Russia will finally fall and collapse unable to compete with stronger states. Turkey will

extend its influence in the Caucasus and partially in Central Asia. This country will actively deal with the Crimea and Odessa, where its interests will face with Ukrainian and Polish interests.

Zbigniew Brzezinski pays a lot of attention to the problem of Russian hegemony and the need to reduce it in Eurasia. Analyzing the consequences of the collapse of the USSR, Brzezinski said that the most painful for Russia was the loss of Ukraine. The emergence of an independent Ukrainian state became a significant geopolitical failure to the Russian state. Independent Ukraine defines the borders of Europe anew. Assessing the importance of Ukraine being independent, Brzezinski emphasized that the very fact of its emergence is the 3rd historically significant event of the 20th century [1].

Besides, the independence of Ukraine deprived Russia of its dominant position in the Black Sea. The loss of Ukraine became crucial, because it radically restricted geostrategic opportunities of Russia. Even without Baltic countries and Poland, but with Ukraine Russia could try to become a leader of Eurasian empire confident in its power.

Brzezinski considers Ukraine to be the geopolitical center of Central and Eastern Europe that considerably influences the balance of power on the European continent as a whole. Ukraine is the geopolitical center, because its emergence helps to transform Russia. He noted that Russia is not the Eurasian empire without Ukraine anymore. Russia can still fight for the status of being an empire, but in that case it will be an Asian state that is more likely to be involved in conflicts with Central Asia. If Ukraine lost its independence, Poland would be automatically turned into a geopolitical center and would lose its desirable and unprecedented security.

Armed aggression of Russia against Ukraine is a long-term impact factor on the system of global and regional security, and the current system of international law.

Russia used the concept of hybrid warfare against Ukraine that is unique in many ways on the side of the structural and functional point of view.

Hybrid warfare is a desire of one state to subordinate another state with the help of political, economic and informational instruments. That's why combat actions are secondary under the hybrid warfare conditions. Information operations and other leverages come to the fore.

Russia tries to solve simultaneously some actual geopolitical tasks with the help of hybrid warfare against Ukraine. The first one is to get rid of a competitor in influencing post-Soviet space, because our country is the only one that has a potential to compete with Russian Federation. The second one is that hypothetical defeat of Ukraine would considerably demoralize countries in Central and Eastern Europe. The third one is that Ukraine used its opportunities received after gaining independence irrationally. The domestic national elite have used neither a unique transit potential

nor the Soviet economic legacy nor the energy of Maidan 2004 properly. Moreover, Ukrainian foreign policy was inconsistent, so that Kyiv had much more developed relations with Moscow in early 2014, and there was no alternative agreement on military and technical cooperation.

Moscow is strongly and aggressively tuned to bring Ukraine back to Russian sphere of influence at any price. The Russo-Ukrainian conflict cannot remain without attention of the international community.

Ukraine as an independent state that has a great natural, economic, cultural and intellectual potential can make a significant contribution to the development of the world civilization and to the ensuring of international security.

If this potential is used wisely, Ukraine can become not a straggler, but a leading state in the region or even in the world.

Ukraine can really strengthen its position at the global level by structural modernization of the economy and large-scale integration into European institutions. The strengthening of strategic cooperation with the US and the development of partnership with Canada will also facilitate.

The formation of models of equal partnership with Poland and Turkey as powerful regional neighbors will be successful at the subregional level.

REFERENCES

1. Бжезінський З. Велика Шахівниця / З. Бжезінський. – Львів – Івано-Франківськ: Лілея-НВ, 2000. – 236 с.

2. Cohen S. Geography and Politics in a World Divided / S. Cohen. – Oxford University Press Inc., 2nd edition, 1974.

3. Friedman G. The Next 100 Years: a Forecast for the 21st Century / G. Friedman. – 1st ed. – New York. – 2009.

UDC: 371.3

V. Mykolaichuk, student
S. Kobzar, Senior Lecturer, research and language advisor
Zhytomyr State Technological University

LEARNING ENGLISH USING VIDEO

Knowledge of foreign languages is very important nowadays and it is well known that English is the most universal language. There is a wide range of language learning methods. Among the most popular the following ones can be named: speaking English every day, listening English radio or podcasts, reading English books, newspapers or magazines, keeping a diary in English, finding an English-speaking pen-pal, expanding vocabulary and using idiomatic phrases, watching

English movies and TV shows, etc [1]. Every method helps to improve specific English skill. Some of the ways may be effective but boring, some may be less effective but very interesting and exciting.

Learning English through movies, films, cartoons or TV shows is an interesting and effective method. But how to watch them to get the best result? When you watch some video in English for the first time, the sound may seem very quiet and some words and phrases are thick, so beginners try to make sound louder. And it is OK, because native English speech is hard to understand due to specific actors' pronunciation. That is why it is highly recommended to watch movies, shows etc. with headphones.

It is good for understanding to start watching English movies with your mother tongue subtitles to get used to English speech. It doesn't mean that you will perfectly understand English speech after watching 10 series of *Breaking Bad* every day. Actually, it will not improve English skills pretty much. It is necessary to watch and understand, and also memorize some words and phrases step by step. In other case without subtitles you will just be getting bored and even angry because you do not understand what the movie is about. After watching movie with mother tongue subtitles the next step will be watching it again with English subtitles and making notes to memorize interesting words and phrases and also to find the meaning of some unknown collocations or slang. To improve your speaking skills and to get your speaking experience you should try to repeat the phrase of specific character with similar intonation emphasizing some words or to role play the dialogues with a friend. It is a good speaking practice not only for beginners but also for advanced learners.

You are not supposed to watch the whole movie. It would be more useful to find an interesting part of a movie full of typical English speech phrases which are very easy to understand, try to learn them and then to use in your own speech.

English teachers who use movies, films, TV shows, cartoons or serials in their practice can advise the best video to every student depending on their learners' English levels.

Dmytriy Petrov, a famous linguist and teacher, tries to awake feelings conducted with specified language which is based on his own experience from books and movies. If you learn Italian — remember movies of Fellini, English —Disney cartoons. This category is highly recommended for learning English. Cartoons are made for kids and family auditory that are always notable for great diction and the vocabulary of their characters is easy to understand.

The films "Forest Gump", "Highlander", "The King's Speech", "The Big Lebowski" also can be recommended. Films by Tarantino are well known for their dialogues that help to fall into English speaking environment. If we are talking about genres we have to admit that usually dramas are more understandable than action movies [2].

Olga Bocharova recommends for beginners to watch thrillers, because there are not so many dialogues there. Then learners can try to watch dramas and only at the higher level they should try comedies. Make up the tradition to watch one movie per week with subtitles if you really want to master your English [2].

Learning English using American sitcoms is one of the best ways. There are well written dialogues with a little slang and good pronunciation of actors. It is the best to watch sitcoms on mobile devices with mother tongue subtitles and doing pauses to note some phrases. Serial "Friends" is recommended for the beginners because of simple vocabulary used there and lack of slang, and "Sex in the city" for large vocabulary. Also serials like "How I Met Your Mother", "Desperate Housewives", "The Big Bang Theory" can be effectively used.

For upper-elementary and pre-intermediate learners it would be nice to watch "Modern Family" because of short series, funny characters, emotional dialogues. First season may seem to be difficult for learners; but do not despair, go ahead. "Mozart in the Jungle", a great serial with lisping actors and Mexican accent of Garcia Bernal, will help to discover New York Symphony Orchestra.

Pre-intermediate learners should grow up and start watching a great serial "Girls". It is full of modern English language which young Americans use in their conversations. There are a lot of small talks, so you have to get used to speed of conversations and slang.

Serials like "Sherlock", "Luther", 'Misfits" are good for intermediate and upper-intermediate. Specific pronunciation and Scotland accent can be found in "Outlander". The serial with Birmingham pronunciation "Peacky Blinders" may be difficult for learners but very informative [2].

Considering all above mentioned we can state that learning English using movies, films, TV shows, serials, etc is very useful and interesting. But people should consider their English level before choosing the movie, serial, etc. Using this method people may develop their listening comprehension skills, expand their vocabulary, memorize common speaking constructions and use them in their speech.

REFERENCES

1. Website www.wikihow.com, [Virtual Resource] // 2016 — Access Mode: URL: http://www.wikihow.com/Learn-English — Date of Access: 28 March 2016.
2. Website https://daily.afisha.ru [Virtual Resource] // 2016 — Access Mode : URL https://daily.afisha.ru/brain/448-kak-uchit-anglijskij-s-pomoshy-filmov-i-serialov — Date of Access: 31 March 2016.

UDC 614.253.52.616.36-002-084

I. Nakonechna, Student
Z. Sharlovych, PhD in Pedagogics, As. Prof., research advisor
Zhytomyr Institute of Nursing

ROLE OF NURSE IN PREVENTION OF HEPATITIS A (HAV) BY THE METHOD OF INFORMING OF THE PUBLIC ABOUT METHODS OF ITS PREVENTION

Rationale. Hepatitis A is one of the difficult and urgent problems of global health protection. Its relevance is defined by widespread hepatitis A, lack of a clear trend towards reducing of sickness rate, available means of prevention and possible development of complications and adverse effects and by significant social and economic losses that are harmful for society and the state.

In Ukraine, the dynamics of the incidence of HAV displays the features of hard-driven infection with periodic difficulties. In the etiological structure of viral hepatitis dominates hepatitis A.

Work objective. To achieve the goal we conducted clinical - statistical analysis of morbidity for the last 5 years in the city of Zhytomyr and Zhytomyr region, it was conducted an interrogation of practicing nurses, attendees of training courses and students of Municipal Institution "Zhytomyr Institute of Nursing Care" to determine the state of basic knowledge of these groups concerning viral hepatitis A.

Obtained results.

Viral hepatitis A (Botkin's disease) - is an infectious disease caused primarily by hepatotropic virus with fecal-oral mechanism of transmission, which is characterized by a primary lesion of the liver, which is a very important organ of life [1, p. 129].

The source of infection is a sick human. The main factors of transmission of HAV can be water, food, household items and more. Often children aged 2-14 years are ill [1, p. 130].

Viral hepatitis is transmitted by the ways, which can be avoided being aware and abiding basic personal hygiene.

After a questionnaire among nurses of the extension courses and the students nurses-bachelors of Municipal Institution "Zhytomyr Institute of Nursing Care» and taking into account clinical and statistical indicators, we concluded that the incidence of hepatitis A is a very serious problem in our time.

Analyzing the data of queues, we found a lack of knowledge about the disease, its prevention methods and prevention among students and among working nurses. This situation may indicate that it was given a few hours in the curriculum to methods of prevention of hepatitis A.

Conclusions. We lean toward the idea that a significant role in the prevention of HAV can and should play, in addition to the relevant services, nurses of healthcare

institutions who are obliged to carry out continuous information and outreach prevention work among the population concerning prevention of HAV.

Particular attention should be paid to highlighting of the problems connected with personal hygiene; sanitary and anti-epidemic measures in kindergartens and schools; early diagnosis of the disease; timely and effective treatment, dissemination of preventive measures by nurses among the population.

REFERENCES

1. Clinical nursing care in infectology: a textbook. - 2nd edition, revised and enlarged. / A.V. Chornovil, R.I. Grytsko, S.A. Lyshenyuk - K.: "Medicine", 2010 – 408p. (P 127-131).

2. Certain indicators of health of population and activity of the branch of health care in the region 2010-2013 // Statistical book. / ZHYTOMYR: ZHODA. – 2014, - P. 66-67.

UDC 378

V. Oleksiuk, student
S. Oliinyk, PhD, As. Prof., research advisor
Y. Karpenko, language advisor
I. Franko Zhytomyr State University

THE PROBLEM OF INTERNATIONAL EXCHANGE FOR UKRAINIAN STUDENTS (personal experience)

In terms of changes and innovations that are actively introduced into the system of higher education in Ukraine the students' studying experience in Europe can become one of the issues worth studying. Today there are many different international educational and cultural programmes that give an opportunity to Ukrainian students to study abroad. As a part of this article our own studying experiences during the first semester of 2015 – 2016 academic year at the Pomorska Academy in Slupsk (Poland) will be analysed.

Through the programme Erasmus +, which promotes international cooperation in the system of higher education, students of different universities of the country, including Zhytomyr State University named after Ivan Franko had an opportunity for both short and long academic stay abroad. As a third year student of Educational and Scientific Institute of Pedagogy (specialty Musical Art*) I had the opportunity to participate in the long-term exchange between Pomorska Academy in Slupsk (Poland) and Zhytomyr State University named after Ivan Franko.

Pomorska Academy in Slupsk is a modern European state university, which has three faculties: faculty of mathematics and natural sciences, faculty of history and

philology, faculty of pedagogy and philosophy. 22 specialties and 100 specializations are offered to students. An archive, a library, sports and rehabilitation center, science center and the center of foreign languages are available at the Academy. At Pomorska Academy at the Institute of music the professional training has two stages: 1st degree studies: Edukacja artystyczna w zakresie sztuki muzycznej (art education in music), specialty - music education (teacher). 2 degree studies: Edukacja artystyczna w zakresie sztuki muzycznej (art education in music), specialty – animation culture. Also there is Studia podyplomowe (postgraduate studies) – Muzyka w edukacji wczesnej z elementami muzykoterapii (Music in primary education with the elements of music therapy), Muzykoterapia z psychohrjfilaktyką stresu (Music therapy).

According to the contract, I studied three courses of the Academy, provided by self-selection of subjects within 30 credits. A variety of subjects contributed to the personal improvement. A distinctive feature of the studying process is that students of the Institute of music focused purely on musical disciplines and do not study such subjects as sociology, medicine, economics, philosophy, physical education, etc. They focuse on their careers and are interested in further development. Impressive is real democracy in all spheres of the university life (eg. a big advantage is that the students themselves have the right to elect a certain number of course credits).

Let me briefly outline the main features of the educational process. Education was extremely productive. The duration of the lessons was quite diverse from 40 min up to 2.5 hours. It should be noted that for teachers and students, the priority is the practical activity compared with the theoretical training, based on current trends of music of the XX-XXI st centuries, e.g. jazz and the art of improvisation. Much attention is paid to collective forms of work, such as: vocal ensemble, choir and chamber orchestra, theatrical musical performances. The selection of the repertoire is organised by students themselves, including their own arrangement.

One of the most popular subjects was nauka akompaniamentu z czytaniem a'vista, where we studied to different songs in different styles and genres (jazz, blues). It is interesting that the students are more interested in modern music, but are also familiar with the classical one.

Passive practice in secondary school (szkoła podstawowa), in which all children have the opportunity to play musical instruments (flute, xylophone, drums) impressed me. The feature of the educational system is that the students of the Pomorska Academy (Institute of Music) on their own initiative, every 3-4 months held musical performances. At the end of the semester I had exam time, the organization of which he is very different to a domestic one. Examinations in the choir, vocal ensemble, conducting, took place in public in the form of an open concert.

The educational system in Ukraine really needs changes. Special attention should be paid to creative professions, which requires not only financial support, but

also a reorientation of the educational process towards greater democratization and freedom of creativity.

UDC 78.08

V. Orykhivskiy, student
S. Oliinyk, PhD, As. Prof., research advisor
Y. Karpenko, language advisor
Franko Zhytomyr State University

TIMBRE DIVERSITY OF MODERN CLARINET MUSIC

Modern research is directed at studying the means of expression in general and the problems of sound aimed at strengthening the effect of expressiveness in music in particular.

Various possibilities of sound in terms of its color, brilliance are modern issues. The style of the musical language of contemporary composers is based on sound and the expressive possibilities of timbre coloring. The issue of sound and timbre are studied in the works of teacher-trainers V. Apatskyy, S. Burkatskyy, R. Wolf, V. Nosov, Y. Usov and others.

Timbre has tremendous power and emotional impact on the listener. Among all the means of musical expression it is considered to be the easiest for perception as it needn't special musical training. Timbre is one of the most important tools in the arsenal of clarinet user. It creates the "living material" of a musical work, which primarily uses a musician.

Music and performing arts have basically different colouristic features. The expressive possibilities of a musical sound can be fully revealed only if it is colorful. Finding the right sound the conductor reveals the artistic image. For each composer is a unique world revealed through a unique sound colouring.

A clarinetist uses different technical means of sound: the use of additional and auxiliary fingerings, selection of different sticks (tongues), the use of multiple mouthpiece, ligature, two or more of similar instruments having different timbre characteristics, the full family of clarinets (starting from bass clarinet and finishing with clarinet in Es).

Let us analyse the usage of these tools to create variety of timbre of sound. Thus, additional fingerings using the same sound can be played in different ways: brightly, dull, crushed, etc. With that change the timbre of sound is a breeze, with no pauses and breaks.

The clarinet gives the artist the opportunity to effectively regulate the tone by selecting appropriate sticks (tongues), which differ in their timbre characteristics that significantly expands the range of expression of the timbre of the instrument. Artists often practice using multiple mouthpieces with different timbre. A significant impact

on the tone of a mouthpiece has the material and design features of the instrument. Interesting colorful effects are created by using of two or more similar instruments having different timbre characteristics. The tone effect achieved by changing the instrument is a fairly common practice with clarinetists. For example, musical phrases that need melodious sound timbre, are usually performed by the clarinet in A. In the future, the tendency can be seen when concert performers will perform a concert for the whole family of clarinets from bass clarinet to the clarinet in Es.

Along with the technical means of sound timbre are used often new sound techniques that enhance the expressiveness of musical instruments. Double staccato provides brightness and brilliance of sound, permanent breathing gives it continuity, glissando passes glide from one note to another, sound oscillation has the effect of fluctuations, smorcato mute, sub tone creates an image of relaxed intimacy. All these techniques greatly expand the scope of timbral possibilities of a clarinet and enrich artistic expression of musical works' image.

Thus, leading expressive means of music in modern brass music compositions is the timbre. Colorful beauty of tunes appeals to our imagination, creating illusory images. This is the hidden force of clarinet timbre palette. With a wide range of new technical and artistic techniques the performer reveals the artistic images of contemporary music.

REFERENCES

1. Апатский В.Н. Основы теории и методики духового музыкально-исполнительского искусства: учеб. пособие / В. Н. Апатский; Нац. музык. акад. Украины им. П.И. Чайковского. – К., 2006. – 432 с.

2. Апатский В. Н. Актуальные проблемы духового музыкально-исполнительского искусства / В. Н. Апатский. – К.: Задруга, 2013. – 588 с.

3. Буркацкий З.П. Инструктивно-художественный материал в системе формирования мастерства кларнетиста: дисс… канд. искуств. /З.П. Буркацкий. – Одесса, 2004 – 351 с.

4. Вовк Р. А. Історія, акустична природа і виразні можливості аплікатури кларнета: автореф. дис.. канд. мистецтвознавства: 17.00.03 «Музичне мистецтво» / Р. А. Вовк. – К., 2004. – 19 с.

UDC 618.19-006-07-084

T. Ruzhenko, Student
O. Ryzhenko, Lecturer
Zhytomyr Nursing Institute

SELF-EXAMINATION IS ONE OF THE METHODS OF SCREENING TESTS OF BREAST CANCER DIAGNOSIS

Breast self-exams is the most efficient way to detect not only breast cancer, but also a variety of benign diseases, as well as some of the underlying diseases, which may occur a malignant tumor. "Professor S. A. Holdin says that dissemination of correct information about the sign of disease, reasonable orientation according to the identified seals, changes in the shape of the breast, nipple discharge and other violations should increase the number of hits in the early periods of the disease. That is why, it is necessary to teach women a systematic examination" [1, с.78].

Self-examination is recommended systematically, once a month, preferably in the period of physiological softening of the breast, i.e. in the first week after menstruation. Women being menopause should choose one of the days and examine themselves monthly.

This method has been confirmed by many countries. According to numerous studies, 75-90% of breast tumors women find themselves without special training of self-examination. By self-examination 59,6% of affected women seek care for breast tumors in stage IV and only 29.9 per cent at stages I or II, and the first reaction to the detection of tumors is mostly a fear of losing the breast, and not fear of dying from cancer. However well informed woman can detect a tumor with a diameter of 0.5-1 cm. According to some reports, tumors smaller than 1 cm metastasize in lymph nodes in 31% of cases, while tumors larger than 5 cm, the frequency of metastases is 73% [3, с.432].

The fight against breast cancer should not be presented to the women themselves, more appropriate is the possibility to receive advice from qualified professionals. However, if a woman takes care of herself, no organizational measures can not achieve such regularity that can be observed by the woman herself. Self-examination can play a positive role for the detection of both precancerous and tumor breast diseases [2, с.80].

REFERENCES

1. З турботою про жінку // Науково - практичний журнал з акушерства та гінекології. - 2014. - № 23. - С. 76-81
2. Педіатрія, акушерство і гінекологія // Науково - практичний журнал. – 2013. - №6. – С. 77-83
3. Сидоренко Л.Н., Мастопатія. /3-є видання, перероблене і доповнене – СПб.: Гіпократ, 2011. – 432с.

UDC 159.9

J. Strelchenko, student
S. Kobzar, Senior Lecturer, research and language advisor
Zhytomyr State Technological University

HOW TO BEAT PROCRASTINATION

If you found yourself putting off important tasks over and over again, you are not alone. Everyone procrastinates sometimes, but some are so chronically affected by procrastination that it stops them fulfilling their dreams and disrupts their careers. So, what is procrastination? In a nutshell, you procrastinate when you put off things that you should be focusing on right now, usually in favor of doing something that is more enjoyable or that you are more comfortable doing. In fact, in any process of creation, procrastination is your greatest enemy [1].

What are the reasons for procrastination in our life? Arun Prabhu [2] specifies four unnecessary reasons for procrastination. He says that most people push things off because they are afraid of failing and not fulfilling expectations and standards set by their parents, friends and society. Furthermore, they are not only afraid of the task itself, but they are, also, frightened by the amount of work that should be done, and, as a result, they do not have enough courage to start. Another reason for procrastination is laziness. "When I get the feeling to do something, I lie down until the feeling goes away," someone said, and it is true. Being lazy consumes a lot of energy after all, most of it needed for trying not to think about the work and doing something funny instead, or doing nothing at all. One more reason why people postpone doing things is that they have different addictions. Nowadays at the age of new technologies and innovations, modern person may be addicted not only to drinking and to drugs, but, also, to social networks, TV and Internet. Communicating in social networks and Internet surfing takes a lot of your productive time, therefore you never have enough time to get your tasks done. Moreover, lots of things can distract you from doing important work. For example, loud music, mess in your workspace, smell of hot coffee or a TV show can steal your attention, and make you feel unsuccessful and unproductive.

What should we do to fight procrastination? Brian Tracy [3], a millionaire and a famous business writer, says that if you want to beat procrastination in your life, *you have to eat your frog first thing in the morning*. Your *frog* is your biggest, most important task, the one you are most likely to postpone during the day. Mark Twain once said that if the first thing you do each morning is *to eat a live frog*, you can go through the day with the satisfaction of knowing that it is probably the worst thing that is going to happen to you on that day. As a result, if you start your day by doing it, other tasks will be much easier for you to accomplish. You will feel more energetic and successful all day long.

Another way you can stop procrastinating is *to avoid sirens songs*. *Sirens songs* are everything that distract you from doing important tasks. Therefore, if you want to be more productive during your worktime, you have to create distraction free environment. One of the first things Steve Jobs [4] did in NeXT, the company he founded after his resignation from Apple, was painting everything white and removing all possible distractions. When he was asked: "Why everything is white? Why is everything so perfect?" He answered: "Because I want to think clearly." Thus, if you want to think clearly too, you should clean out all distractions, try to work alone as much as possible, and get rid of the clutter because mess creates stress and brings disorder to your mind.

You also can fight procrastination by *eating an elephant by pieces*. Your *elephant* is a big and complicated project that overwhelms and frightens you, therefore you have to divide this big *elephant* into small bite size manageable segments. Think about what is needed to be done and write down what you are going to do to tackle this project hour by hour, and make it specific. By breaking down this giant project into small tasks, this *elephant* will become a lot less daunting, and you will be less likely to procrastinate.

The last but not least thing you should do to kill your monster of procrastination is to make a declaration of your project's deadline [5]. It is necessary to admit that declaring your project's deadline is crucial, because if you do not have the deadline and nobody knows about the project you are working on, it does not matter whether you are procrastinating, and you will continue doing it forever. In a recent study, two groups of university students were assigned to write three papers in three weeks [6]. First group was given an opportunity to turn in all three papers at any point during those three weeks. Second group had strict weekly deadlines for each paper. Ultimately, the ones who did the best on the papers were the ones that were given strict deadlines, as for another group with the students who had to pick their own deadlines, they did poorly. Obviously, humans are not the best in regulating themselves that is why public declaration will motivate you to get everything done in time.

Overall, as technology keeps advancing, more and more ways to kill time are appearing. As a result, people are more likely to put off work. However, the work is still needed to be done, regardless of our views on it. Therefore, if you have procrastination problem, you should do just four things to overcome it. Firstly, you have *to* ***pick a frog and eat it*** **first thing in the morning.** Take one big, dreaded task and get it over with. Relish in the accomplishment, and then tackle the little things. Secondly, you should *avoid sirens songs* during your work. Create distraction free environment that will allow you to think clearly. Thirdly, eat an *elephant by small pieces*. You should divide big projects into small specific tasks, and write the plan how you are going to reach your goal. Finally, make a *public declaration*. Let people know about your project and its deadline. To sum up, overcoming your

procrastination habit will help you to become more productive, and will bring you to a new level of performance and lifestyle.

REFERENCES

1. Iwuoha , John-Paul *Procrastination is a slow but deadly killer. Here are five simple ways entrepreneurs can fight it.* [Electronic resource] — Access mode — http://www.smallstarter.com/get-inspired/how-to-avoid-procrastination-in-5-simple-steps/
2. Prabhu, Arun *Why do people procrastinate?* [Electronic resource] — Access mode. — http://www.buzzle.com/articles/why-do-people-procrastinate.html
3. Tracy, Brian. *The truth about frogs* [Electronic resource] — Access mode. — http://www.briantracy.com/blog/time-management/the-truth-about-frogs/
4. Sharma, Robin *How I beat procrastination* [Electronic resource] — Access mode. — https://www.youtube.com/watch?v=bLp9EimaEQI
5. Duffield-Thomas, Denise *How to fight procrastination* [Electronic resource] — Access mode. — http://luckybitch.com/how-to-fight-procrastination/
6. WatchWellCast, *How to stop procrastinating?* [Electronic resource] — Access mode. — https://www.youtube.com/watch?v=Qvcx7Y4caQE

UDC 82.0=411.21

Yu. Sukhovetska, the fourth year student
Arabic Language and Literature and Translation
Institute of Philology of Taras Shevchenko National University of Kyiv

THE ANALYSIS OF THE NAGUIB MAHFOUZ' INTELLECTUAL WORKS ON THE EXAMPLE OF THE NOVELS «THE THIEF AND THE DOG» AND «THE SEARCH»

Last decades, the number of literary studies related to the deep analysis of works of literature has significantly increased. It is known that Naguib Mahfouz novel series of the 60s initiated a major restructuring of the entire aesthetic system of Arabic prose. Many author's stylistic and poetic innovations have been reflected in the works of novelists of a younger generation in different ways. The first novelistic experiments of so-called new wave of authors appeared in 60s. Thus, the mentioned above cycle deserves a special attention.

The detailed analysis of the novels "The Thief and the Dogs" (1961) and "The Search" (1964) shows how a new socio-historical situation formed in Egypt affects the nature and the development of problems which were traditional in Mahfouz's works. Such socio-historical situation results in significant changes in his novelistic poetics and causes reorientation of the relations with the western literary tradition.

Setting the research task to make a comprehensive study of two novels "The Thief and the Dogs" and "The Search" we consider a well-known opinion of N.N. Bakhtin that the author's outlook on the history of literature exists only as a principle of particular literary structure and it is the only form it can be objectively investigated on the basis of empirical material of definite literary works.

The main role of the research is to identify the characteristics of the intellectual Naguib Mahfouz' novel which are related to the stable, traditional elements of his worldview and artistic thinking, as well as to the new elements that led to the creation of a completely different, compared to the previous one, type of the novel. "The Thief and the Dogs" and "The Search", which, respectively, are the first and the third novels of the Mahfouz' intellectual cycle, were selected as the subject of research based on the fact that they are the key to the relationship problems of "Man and Society", and "Man and the Absolute". In addition, both novels are characterized by multiplicity of meanings, which have caused different and conflicting critical interpretations of these works by researchers.

The research implies that the analysis of these novels should begin with a review of previous works of Naguib Mahfouz in terms of basic ideological and metaphysical problems, which were both the focus of the writer's artistic thought at different times, and the methods of artistic expression.

A sufficient number of papers, books and articles, which studied Mahfouz' works didn't perform a comparative analysis of writer's works of intellectual and earlier periods. This is why, the research is determined by the scientific novelty.

UDC 781.1

A. Svyrydiuk, student
S. Oliinyk, PhD, As. Prof., research advisor
S. Kuriata, language advisor
Zhytomyr Ivan Franko State University

MUSIKTHERAPIE ALS EINFLUSSMITTEL AUF DIE PSYCHE EINER PERSON

Aus alten Zeiten gilt Musik als Mittel des Genusses und der Äußerung der Empfindungen und Gefühle. Diese Gefühle und Empfindungen werden zu anderen beim Hören derjenige oder andere Musikwerke. Aus diesem Grund entstand der Typ der Psychotherapie, das heißt Musiktherapie. Heute, in der Zeit Veränderungen und Stressen ist die Anwendung des Einflusses der Musiktherapie auf die Psyche einer Person sehr aktuell.

In der Ukraine wird dieses Problem von W. Lokarewa, I. Malaschewska, H. Poberezhna, I. Pusytsch, Y. Pusytsch, O. Fedij und von anderen untersucht. Den Interessen für Musiktherapie zeigen solche Wissenschaften wie Psychologie, Pädagogik, Medizin, Physiologie.

Musik beeinflusst direkt psychologische Prozesse zum Beispiel: Andenken, Aufmerksamkeit, Erfassen und andere. Wenn der Einfluss richtig geleitet wird, kann man gute Ergebnisse erhalten. So Andenken und Orientierung werden sich auf 45-50% erhöht, Aufmerksamkeit wird auf 25-30% verbessert.

Aufbesserungen des gemeinen psychologischen Zustands des Menschen mit Hilfe der Musik geschehen durch den Einfluss auf sein psychophysiologisches Apparat. Demgemäß die klassische Musik verbessert psychische Leistungsfähigkeit der Menschen, Rockmusik beeinflusst den Hörapparat. Teenager von 13 bis 15 Jahren, etwa 40%, leiden an Gehörlärm und 60% 20-jährigen Jugendlichen hören schlecht.

Aufsteigen der Intelligenz, der Kennziffern der psychologischen und physiologischen Prozesse, Leistungsfähigkeit unter Auswirkung der Musik macht nötig die Anwendung der Musiktherapie nicht nur in Psychologie und Medizin, sondern auch in der Pädagogik, weil Musik^

- sich Fähigkeit eines Kindes zu analysieren entwickelt;
- die Laune beeinflusst;
- die Sprache und Psyche formiert;
- den psychologischen Zustand harmonisiert;
- sich eine Person erzieht;
- ein Kind zu den Situationen adaptiert.

Man kann zusammenfassen, dass die Musiktherapie eine große Rolle in der Formierung der Psyche einer Person spielt und aktiv die Psyche einer Person beeinflusst. Offenbar ist, soll diese Therapie kontrolliert sein um eine positive Ergebnisse zu erhalten.

REFERENCES

1. Кузьмінська Л. Зміст та цілі музикотерапії в соціально-педагогічній роботі з дітьми-інвалідами [Електронний ресурс] / Л. Кузьмінська. // Освіта регіону. Політологія. Психологія. Комунікації. – 2011. – №4. – Режим доступу до ресурсу: http: // www.vmurol.com.ua / index. php? idd=us_publication group=11&us_publication=741.
2. Любан-Плоцца Б. Музыка и психика: Слушать душой / Б. Любан-Плоцца, Г. Побережная, О. Белов. – К.: "АДЕФ - Украина", 2002. – 200 с.
3. Марчук О.П. Музикотерапія як одна з форм немедикаментозного лікування людини [Електронний ресурс] / О.П. Марчук. – 2006. – Режим доступу до ресурсу: http: // www.rusnauka.com / ONG_2006/MusicaAndLife / 17871.rtf.htm

UDC 781.1

K. Tarasevych, student
S. Oliinyk, PhD, As. Prof., research advisor
S. Kuriata, language advisor
Zhytomyr Ivan Franko State University

ANWENDUNG DER MUSIKTHERAPIE IM PROZESS DER AUSBILDUNG DER ZUKÜNFTIGEN LEHRER

Unter der Vielzahl von modernen Trends der Entwicklung des Kindes ist die Musiktherapie sehr wichtig. Wissenschaftlich ist bewiesen, dass die Musik ein wirksames Mittel ist, das auf den psychischen und den körperlichen Zustand der Person auswirkt. In heutigen hektischen Tagen werden neue alternative medizinische Prävention und psychologische Mittel gesucht, die die geistige und physiologische Reservekapazität des Organismus vergrößern. Mehr Anerkennung haben die Methoden der Restaurierung, die Stärkung und Erhaltung des körperlichen und geistigen Wohlbefindens, die mit den verschiedenen Arten von Kunst verbunden sind. Eine dieser Methoden ist die Musiktherapie.

Aus den alten Zeiten wurde Musik als ein leistungsfähiges medizinisches Mittel zur Verbesserung anerkannt. Seit Jahren erfährt man von Musikwerken rechts, die menschliche Gesundheit zu verbessern. Als Ergebnis werden im zwanzigsten Jahrhundert die Schulen für Musiktherapie organisiert. Die Beispiele solcher Schulen sind die schwedische Schule (Katharsis-Effekt), die amerikanische Schule (Korrektur für geistige Anregung oder Ruhe), die deutsche Schule (Synthese verschiedener Künste in Konzert), die russische Schule (Einfluss von Musik auf Psychosomatik).

In den letzten zehn Jahren wird sich die Musiktherapie in der Ukraine aktiv entwickelt. Die Gründer der ukrainischen Fundation ist Doktor der Künste, Professor, Leiter des Kiewer Zentrums für Kunsttherapie und Psychodiagnostik H. Poberezhna. Die Wissenschaftlerin sagt, dass die Anwendung, der Musik bei der Bildung der psychologischen Kultur einer Person, der menschlichen Transformation angeborenen Verhaltensmuster, wichtig sind um eine harmonische Persönlichkeit zu werden. Die Forscherin betont, dass die strategische Ausrichtung der Ausbildung der zukünftigen Musiklehrer die psychische Gesundheit als ein Mittel ist, um die Probleme der technokratischen Welt zu überleben.

Heute entwickelt sich die pädagogische Richtung der Musiktherapie auf allen Ebenen der Bildung in der Ukraine aktiv. Man soll betonnt, dass soziale und pädagogische Richtung der Musiktherapie weit angewendet.

Die Analyse der letzten nationalen Studien und Veröffentlichungen zeigt die Anwesenheit von wissenschaftlich begründeten Leistungen der Probleme der Anwendung der Musiktherapie in der pädagogischen Praxis.

UDC 614.2:65.015

S. Tevs, Master student
V. Shatylo, Doctor of Medicine, Prof., research advisor
N. Shygonska, PhD in Ped., As. Prof., language advisor
Zhytomyr Nursing Institute

PROVIDING THE QUALITY ASSESSMENT SYSTEM OF NURSING CARE WITHIN MULTI-FIELD HOSPITAL

Introduction. Medical services quality satisfaction greatly contributes to further medical services development. The important role in this process belongs to nursing staff who supports patients as well as practices all medical manipulations; from keeping documents to making intramuscular and intravenous manipulations.

Quality monitoring and quality assessment are those constituents that make sufficient contribution to quality supply of multi-field hospital.

The objective of the paper is to analyze and systemize the quality assessment system within multi-field hospital.

Results and discussion. Medical care quality is the independent providing of all necessary measures influencing the final result oriented at improving peoples' health. The problems of medical treatment quality control and medical care standardization were explored in the research and practical works of many scientists: V.Ponomarenko, A.Stepanenko, A. Zimenkovskii [3; 6; 8]. Theoretical and methodological principles of forming state and social norm in healthcare were introduces by N. Jiarosh and A. Zimenkovskii [1; 3; 10].

Medical care quality numbers different characteristics:

- Professional competence;
- Accessibility;
- Productivity;
- Personal interaction;
- Economic efficiency;
- Safety;
- Lifelong progress;

The essential constituents that depict healthcare system quality multi-functionality are:

- Structural quality – technical capability;
- Processual quality – technologies of diagnostics, treatments and prevention;
- Effective quality – achieving necessary clinical indexes collated to economical ones.

Medical care quality control has two general criteria:

- Quality of conformance – degree of conformity of general standards to internal specifications;

- Quality of performance – the degree of patients' satisfaction [2].

Nursing staff backs the quality assessment system within multi-field hospital. Thus, we can define the quality of nursing care as the accordance between patients' expectations from the medical services and its result. This phenomenon greatly depends upon various factors among which: accuracy of manipulation and medical algorithms execution, documents keeping, self-development [9].

Standardization as the process in medical and nursing practice sufficiently influences the patients' quality care, regulates and monitors its quality.

Conclusions.

1. Searching new quality criteria leads to new healthcare standards.
2. New standards consider the principles of evidence-based medicine.
3. Medical care quality ought to correspond to the established standards.
4. Structuring, setting of standards and controlling contribute to nursing care quality assessment.

REFERENCES

1. Архипов В.Е. Принципы эффективного менеджмента и маркетинга. – М.: Инфра-М, 2007. – 46 с.
2. Голованова І.А. Сутність і особливості оцінки якості медичної допомоги населенню. Формування стандартів якості різних видів медичної допомоги [http://www.umsa.edu.ua/lecture/socmed/lekt_osobl_ocinki_yakosti.pdf]
3. Зіменковський А.Б. Системний підхід до оцінки якості медичної допомоги в період реформу- вання охорони здоров'я в Україні // Вісн. соц. гігієни та організації охорони здоров'я. - 2003. - С. 42-45.
4. Карамишев Д.В. Управління якістю медичної допомоги в контексті інноваційних перетворень системи охорони здоров'я [http: // academy.gov.ua/ej/ej3/txts / GALUZEVE/10-KARAMISCHEV.pdf]
5. Мартиненко Л.В. Якість медичної допомоги пацієнту - якість життя медика / Л.В.Мартиненко // Жіночий лікар. – 2006. – № 01. – С. 36-42.
6. Пономаренко В.М., Зіменковський А.Б. Стан стандартизації в охороніздоров'я України та шляхи її подальшого розвитку // Вісн. соц. гігієни та організації охорони здоров'я. - 2004. - № 2. - С. 43-47.
7. Про порядок контролю якості медичної допомоги // Наказ МОЗ України № 752 від 28.09.2012 р.
8. Степаненко А. Сучасні принципи стандартизації в медицині // Ліки України. - 2003. - № 4. - С. 57-58.
9. Худошина О.В. Контроль якості надання медичної допомоги у закладах охорони здоров'я [http://www.apteka.ua/uploads/2014/10/hudoshina.pdf]
10. Ярош Н. Теоретико-методологічні підходи до формування державних соціальних нормативів надання медичної допомоги // Вісн. НАДУ. - 2004. - № 3. - С. 246.]

UDC 72.01

M. Vasevych, Graduate student
O. Mykhaylyshyn, Dr. Sc. in Architecture, Prof., research advisor
The National University of Water and Environmental Engineering

GENDER HIERARCHY IN THE HISTORY OF ARCHITECTURE

The complexity of the relationship and interplay of social and architectural spaces raises question about the importance of a multidisciplinary approach. Sociology of architecture allows to trace the social representation within architectural space and, specially, it's gender aspects. The basic gender categories which are masculinity and femininity reveal social collision in architectural field. One of the key fact, that gendered roles are closely related to hierarchical systems in architecture, which for the long time developed in conservative terms. This work is dedicated to historically conditioned gendered roles in architectural space.

Michel Foucault, points that architecture is designed to be a tool for the transformation of individuals, to control their behavior, bring exercises of power, and knowledge to change them. Patriarchal power conceptualized in structure of public and private spaces since primitive societies, and established in Antic ideology, that launched the development of gender division in society, and particularly in architecture. Social relations, according to Pierre Bourdieu, is connected with the physical space and formed by a system of basic oppositions, among which there is significant contrast between male and female [1, p.31-46]. His concept of habitus, as a system of durable acquired dispositions, implies subordination of women to men, although sometimes they may exploit their freedom to initiate social change. Social practices of men and women constructs gendered roles especially through architecture. Spatial organization help to represent gender relations and support dominant male ideology [2, p.73-74]. For example, the masculine connotation of the agora, or market area was underlined by one or two rows of religious statues – herms, which represent the democratic male citizen in his sexual and political autarchy. Women were not allowed to visit male public spaces. Architecture of private houses, maintained the separation of the sexes [3, p.116-119, p.130]. The correlation of masculinity and feminity in architecture is represented by blurred or established boundaries of public and private spaces and interior configuration.

Qualities of male and female have been developed in the morphology of architectural elements. The classical proportions of Doric, Ionic and Corinthian columns were attributed to the human body. And it is apparent, that more ornamented and delicate Ionic and Corinthian columns were derived from the women stature and appearance. The gender symbolism of the column orders also included a hierarchy in the terms of their power representation. In theory, it is often postulated, that Doric column in its meaning as a masculine order was most important and superior to feminine orders. Leon Battista Alberti followed the statement, that Doric order

emphasize the highest quality – gravity, while more ornated Corinthian order would be fitting for garden pavilions and interior spaces [3, p. 93-105].

In the monumental XV century treatise "On the Art of Building in Ten Books" Alberti openly refers to the participation of patriarchal authority in the design, including spatial and subordinate visual inspection system, including the issue of gender identity. His vision of space is grounded in privatization of sexuality, which is understood as female. Alberti divide the architecture into "lineaments", which derive from mind, and "matter" which derives from nature. "Lineaments" are a kind of order lines, that defines "appropriate place" for the building and its parts. Formulated with masculine mind of the architect, the geometric order control feminine materiality of house, that has been appropriated from nature [4, p. 343-360]. In 1537 the architect Sebastiano Serlio in his Seven Books on Architecture described three stage sets, which represent diagrams of masculine and feminine spaces. The first tragic scene illustrates man-made, proportional, ordered architecture, second comic scene shows everyday life, and third, satiric is a scene of nature or garden, place, associated with feminine. Buildings of Alberti, Bruneleski, Bramante represent strict geometric order, clear masculine logic. It was considered that feminine, embodied in ornament, hid and blur the reality of structure [5, p. 88-98].

For a long time, the architecture has considered as "male" sphere of activity. Patriarchal character of profession and established canons reproduced social order that included the role of man as creator and woman as an enclosed observer. Since Vitruvian man, the perfect man's body has become a model for architectural design, restrained classic architecture was closely linked to the then notions of male self-presentation. Within the period of rising classicism, in seventeenth century, architect Inigo Jones (1573-1652) in his theoretical work promoted the connection between architecture and ideas of masculine nobility. According, to Jones, building should be the embodiment of both masculine and feminine, exterior bearing the public face of dignity and gravity, interior representing emotions, the female domain. [6, p.7-25] Consequently, exterior, the public man space, acted as protection curtain to private feminine space, creating symbolical visual restrict to internal parts of building. At first glance this interior specialization seemingly to give women their own space, but the reality was somewhat more ambiguous in its consequences. This space was not created for the woman herself, but rather it reflects the necessity of imposed rituals. [5, p. 80-83]

Architectural space is not simply a location that provides social relations, but it creates conditions for gender identity. Theoretical background and implementations of the hierarchy of gender relations represent development of masculine approach to architectural space. While public space reveals the male power, private space hides woman. It was assumed, that in historic precedents, architecture was an expression of patriarchal social order that defines standards and rules of behavior, especially for women. Concealment and restriction in architecture of the naturalness, which has female quality, was justified not only by protection of the private sphere of life, but

also by denial and fear about the possibilities of women to expand their sphere of influence.

REFERENCES

1. Вильковский М.Б. Социология архитектуры / М.Б. Вильковский. – М.: Фонд "Русский авангард", 2010. – 592 с.
2. Hills H. Architecture as Metaphor for the Body: The Case of Female Convents in Early Modern Italy / H. Hills // Gender and architecture/ edited by Louise Durning and Richard Wrigley, 2000. – New York: John Wiley & Sons Ltd, Baffins Lane, Chichester, West Sussex PO19 1UD, England. – P.67 – 112.
3. Kuhlmann D. Gender Studies in Architecture. Space, power and difference / D. Kuhlmann. – New York: Routledge, 2013. – 288 p.
4. Wigley M. Untitled: The Housing of Gender / Mark Wigley // Sexuality and Space. Ed. Beatriz Colomina. – New York: Princeton Architectural Press, 1992. – P.327-389.
5. Betsky A. Building Sex: Men, Women, Architecture, and the Construction of Sexuality /Aaron Betsky. New York: William Morrow and Company, Inc., 1995. – 236p.
6. Anderson *C.* A Gravity in Public Places: Inigo Jones and Classical Architecture / Anderson Christy // Gender and architecture/ edited by Louise Durning and Richard Wrigley, 2000.- New York: John Wiley & Sons Ltd, Baffins Lane, Chichester, West Sussex PO19 1UD, England. – P.7-28.

UDC 61:17

O. Veselska, student
N. Samborska, language advisor
Zhytomyr Nursing Institute

TO CLONE, OR NOT TO CLONE?

Cloning is a topic, which provokes loud debates among scientists and ordinary members of the society. Fantastic pictures created by many generations of the fiction writers came to be more real than they have expected. Cloning isn't a term from the fiction novel any more but a reality we have to meet and react accordingly. Rapid development of new technologies in this field put the question of cloning from the plane of mere moralizing to more practical plane. We have our first real clones, though they are not human beings — yet.

Scientists and ethicists have debated the implications of human and non-human cloning extensively when scientists at the Roslin Institute in Scotland produced Dolly.

The gene revolution began in 1997, when British scientists from Edinburgh University produced the first cloned sheep, Dolly. Since then scientists have cloned mice, cows, dogs and pigs.

No direct conclusions have been drawn, but compelling arguments state that cloning of both human and non-human species results in harmful physical and psychological effects on both groups.

Human cloning is the creation of a genetically identical copy of a human. The term is generally used to refer to artificial human cloning, which is the reproduction of human cells and tissue. It doesn't refer to the natural conception and delivery of identical twins. Now human reproductive cloning is illegal.

Two commonly discussed types of theoretical human cloning are: therapeutic cloning and reproductive cloning. Therapeutic cloning involves cloning human cells for use in medicine and transplants, and is an active area of research. Reproductive cloning involves making an entire cloned human, instead of just specific cells or tissues.

There is a wide variety of cloning methods. Here are basic ones:

- Somatic cell nuclear transfer ("SCNT").[2]
- Embryo twinning.
- Induced pluripotent stem cells ("iPSCs"). [1] [4]

Cloning is an experimental and not well understood method. It has a lot of dangers:

- About one out of 100 cloning attempts ending in a viable animal.
- Cloned animals also have poor health and don't have ability for normal development.
- Many animals are born with abnormally large organs and as a result they often die early or need to be euthanized.

As a big ethic problem cloning has a lot of outcomes. Human cloning is an intervention in being of Big Mystery. We know a lot about genes and mutations, but this knowledge useless on practice. It was mentioned about dangers of human cloning. Main religious representatives have negative attitude to cloning, especially Muslims.

To my mind, human shouldn't be as a production of manufacturing. Many people don't know nuances of clones' consciousness. They think, what`s the matter with trying to clone Attila or Tamerlane? But clone has only genotype of this person. Character will depend on external environment and education.

We have scared about opportunity of growing clones for organs. It is connected with many moral aspects and lowed status of this clones.

Other outcomes are:

- Illicit cloning: there is also the potential for someone to clone you illegally.
- Raising the dead: a lot of dead people can "rise from grave".
- Rendering biosignatures useless: facial and fingerprint recognition would pull multiple matches.

Science fiction has used cloning, due to the fact that it brings up controversial questions of identity.

Most popular examples of using this theme are [3][6]:

- In Aldous Huxley's Brave New World (1932), human cloning is a major plot. There we have world "from bottle". People are split into five castes, hatched by the state to fill preset positions in society. The lower castes, which are clones, are treated with chemicals to arrest their mental and physical development. Children are treated by a process which gives them only information appropriate to their caste.

- In the futuristic novel The House of the Scorpion, clones are used to grow organs for their wealthy "owners", and the main character was a complete clone.

- Star Wars portrays human cloning in Clone Wars, Star Wars Episode II: Attack of the Clones and Star Wars Episode III: Revenge of the Sith, in the form of the Grand Army of the Republic, an army of cloned soldiers.[5]

In conclusion, we must say that cloning of a human being is a big ethic problem. To clone, or not to clone… That is the question… Now we have two sides of the problem. On the one hand, cloning is a rude interference into the natural process of procreation. On the other hand, some people think that potential benefits outweigh the potential harms of cloning. Cloning would be probably used by infertile people who use donated sperm, eggs, or embryos now. It may provide a way for completely sterile individuals to reproduce.The dilemma is very complex. So, human cloning cannot proceed without crossing numerous ethical boundaries and therefore all existing social and legal pros and contras should not be set aside.

REFERENCES

1. Binder, edited by Marc D.; Hirokawa, Nobutaka; (eds.), Uwe Windhorst (2009). Encyclopedia of neuroscience ([Online-Ausg.] ed.). Berlin: Springer. ISBN 978-3540237358. [Електронний ресурс] - Режим доступу: https://en.wikipedia.org/wiki/Human_cloning
2. Gilbert, Scott F. (2013-06-30). Developmental Biology, 10th ed. Sinauer Associates, Inc. pp. 32–33. ISBN 9780878939787. [Електронний ресурс] - Режим доступу:https://en.wikipedia.org/wiki/Human_cloning
3. Hopkins, Patrick. "How Popular media represent cloning as an ethical problem" 28. The Hastings Center. pp. 6–13. JSTOR 3527566. [Електронний ресурс] - Режим доступу:https://en.wikipedia.org/wiki/Human_cloning
4. Kaplan, Karen (2009-03-06). "Cancer threat removed from stem cells, scientists say". Los Angeles Times.[Електронний ресурс] - Режим доступу: https://en.wikipedia.org/wiki/Human_cloning
5. Star Wars: The Clone Wars on IMDB [Електронний ресурс] – Режим доступу: http://www.imdb.com/title/tt1185834/
6. "Yvonne A. De La Cruz "Science Fiction Storytelling and Identity [Електронний ресурс] - Режим доступу: https://en.wikipedia.org/wiki/Human_cloning

UDC 61:17

N. Yaschuck, student
N. Serdega, language advisor
Zhytomyr Nursing Institute

TERRIBLE DISEASE

Tuberculosis (TB) is a potentially serious infectious disease that mainly affects your lungs. The bacteria that cause tuberculosis are spread from one person to another through tiny droplets released into the air via coughs and sneezes.[5]

Once rare in developed countries, tuberculosis infections began increasing in 1985, partly because of the emergence of HIV, the virus that causes AIDS. HIV weakens a person's immune system so it can't fight the TB germs. In the United States, because of stronger control programs, tuberculosis began to decrease again in 1993, but remains a concern.

Many strains of tuberculosis resist the drugs most used to treat the disease. People with active tuberculosis must take several types of medications for many months to eradicate the infection and prevent development of antibiotic resistance.

Symptoms and causes

Symptoms

Although your body may harbor the bacteria that cause tuberculosis, your immune system usually can prevent you from becoming sick. For this reason, doctors make a distinction between:

- **Latent TB.** In this condition, you have a TB infection, but the bacteria remain in your body in an inactive state and cause no symptoms. Latent TB, also called inactive TB or TB infection, isn't contagious. It can turn into active TB, so treatment is important for the person with latent TB and to help control the spread of TB. An estimated 2 billion people have latent TB.
- **Active TB.** This condition makes you sick and can spread to others. It can occur in the first few weeks after infection with the TB bacteria, or it might occur years later.

Signs and symptoms of active TB include:

- Coughing that lasts three or more weeks
- Coughing up blood
- Chest pain, or pain with breathing or coughing
- Unintentional weight loss
- Fatigue
- Fever
- Night sweats
- Chills
- Loss of appetite

Tuberculosis can also affect other parts of your body, including your kidneys, spine or brain. When TB occurs outside your lungs, signs and symptoms vary according to the organs involved. For example, tuberculosis of the spine may give you back pain, and tuberculosis in your kidneys might cause blood in your urine.[5]

When to see a doctor

See your doctor if you have a fever, unexplained weight loss, drenching night sweats or a persistent cough. These are often signs of TB, but they can also result from other medical problems. Your doctor can perform tests to help determine the cause.

The Centers for Disease Control and Prevention recommends that people who have an increased risk of tuberculosis be screened for latent TB infection. This recommendation includes:

- People with HIV/AIDS
- IV drug users
- Those in contact with infected individuals
- Health care workers who treat people with a high risk of TB

Causes

Tuberculosis is caused by bacteria that spread from person to person through microscopic droplets released into the air. This can happen when someone with the untreated, active form of tuberculosis coughs, speaks, sneezes, spits, laughs or sings.

Although tuberculosis is contagious, it's not easy to catch. You're much more likely to get tuberculosis from someone you live with or work with than from a stranger. Most people with active TB who've had appropriate drug treatment for at least two weeks are no longer contagious.[4]

HIV and TB

Since the 1980s, the number of cases of tuberculosis has increased dramatically because of the spread of HIV, the virus that causes AIDS. Infection with HIV suppresses the immune system, making it difficult for the body to control TB bacteria. As a result, people with HIV are many times more likely to get TB and to progress from latent to active disease than are people who aren't HIV positive.

Risk factors

Anyone can get tuberculosis, but certain factors can increase your risk of the disease. These factors include:

Weakened immune system

A healthy immune system often successfully fights TB bacteria, but your body can't mount an effective defense if your resistance is low. A number of diseases and medications can weaken your immune system, including:

- HIV/AIDS
- Diabetes
- Severe kidney disease

- Certain cancers
- Cancer treatment, such as chemotherapy
- Drugs to prevent rejection of transplanted organs
- Some drugs used to treat rheumatoid arthritis, Crohn's disease and psoriasis
- Malnutrition
- Very young or advanced age

Traveling or living in certain areas

The risk of contracting tuberculosis is higher for people who live in or travel to countries that have high rates of tuberculosis and drug-resistant tuberculosis, including:

- Africa
- Eastern Europe
- Asia
- Russia
- Latin America
- Caribbean Islands

Diagnosis

During the physical exam, your doctor will check your lymph nodes for swelling and use a stethoscope to listen carefully to the sounds your lungs make while you breathe.

The most commonly used diagnostic tool for tuberculosis is a simple skin test, though blood tests are becoming more commonplace. A small amount of a substance called PPD tuberculin is injected just below the skin of your inside forearm. You should feel only a slight needle prick.[2]

Blood tests

Blood tests may be used to confirm or rule out latent or active tuberculosis. These tests use sophisticated technology to measure your immune system's reaction to TB bacteria. QuantiFERON-TB Gold in-Tube test and T-Spot.TB test are two examples of TB blood tests.

These tests require only one office visit. A blood test may be useful if you're at high risk of TB infection but have a negative response to the skin test, or if you've recently received the BCG vaccine.

Treatment

Medications are the cornerstone of tuberculosis treatment. But treating TB takes much longer than treating other types of bacterial infections.

With tuberculosis, you must take antibiotics for at least six to nine months. The exact drugs and length of treatment depend on your age, overall health, possible drug resistance, the form of TB (latent or active) and the infection's location in the body.

Recent research suggests that a shorter term of treatment — four months instead of nine — with combined medication may be effective in keeping latent TB from becoming active TB. With the shorter course of treatment, people are more likely to take all their medication, and the risk of side effects is lessened. Studies are ongoing.

Preparing for your appointment

If you suspect that you have tuberculosis, contact your primary care doctor. You may be referred to a doctor who specializes in infectious diseases or lung diseases (pulmonologist).[1]

What you can do

- **Be aware of any pre-appointment restrictions.** At the time you make the appointment, be sure to ask if there's anything you need to do in advance.
- **Write down any symptoms you're experiencing**, including any that may seem unrelated to the reason for which you scheduled the appointment.
- **Write down key personal information**, including any recent life changes or international travel.
- **Make a list of all medications,** vitamins or supplements that you're taking.
- **Write down questions to ask** your doctor.

Preparing a list of questions can help you make the most of your time with your doctor. For tuberculosis, some basic questions to ask your doctor include:

- What's the most likely cause of my symptoms?
- Do I need any tests?
- What treatments are available? Which do you recommend?
- What if the treatment doesn't work?
- How long do I have to stay on the treatment?
- How often do I need to follow up with you?
- I have other health problems. How can I best manage these conditions together?

What to expect from your doctor

Your doctor may ask some of the following questions:

- What are your symptoms, and when did they start?
- Does anyone you know have active tuberculosis?
- Do you have HIV or AIDS?
- Were you born in another country, or have you traveled in another country?
- Have you ever lived with someone who had tuberculosis?
- Were you vaccinated against tuberculosis as an infant?
- Have you ever had tuberculosis or a positive skin test?

- Have you ever taken medicine for TB? If so, what kind and for how long?
- What kind of work do you do?
- Do you use alcohol or recreational drugs?[4]

UDC 172.4

V. Zagorovska, student
V. Zahurska-Antoniuk, PhD in Political Sciences, As. Prof., research advisor
S. Kobzar, Senior Lecturer, language advisor
Zhytomyr State Technological University

HYBRID WAR: NATURE AND STRUCTURE OF THE PHENOMENON

The traditional understanding of the classical war formed in our civic consciousness by upbringing and education, has always had patriotic and historical orientation. We imagine a war as a process of confrontation of two parties located on opposite sides of the front. The enemy invades our land, we win it back and continue to live.

Currently, however, new forms of war as the armed conflict of the countries appear and are implemented. What does a hybrid war mean? This is the confrontation, which arises as a consequence of technological development, technical growth of defensive tools level, offensive weapons, in other words, technologies of warfare.

Specifics of the armed conflict, as well as the place and role of the military argument in politics, are naturally determined by the development level of society and technology. The process of sophistication of weapons and methods of warfare occurs in waves and is synchronous with the evolution of social organization and consciousness.

The information society generates peculiar forms of confrontation, and it does not have to be armed or open. Considerable attention is given to the analysis of the development of warfare forms and methods in modern and future wars (conflicts) in national and international scientific publications on military subjects.

This is due to their rapid development, which is considered by most experts as the emergence of new generation wars, and the need to determine the strategy of the states armed protection organization.

The author of the concept of a new war is Frank G. Hoffman, a former marine corps officer, scientific officer of the Ministry of defense of the USA, a great theorist in the field of armed conflicts and military-political strategy [1].

Today the topic of *hybrid wars* is already widely covered in the media, and is the subject of special studies. In particular, these studies were conducted by

renowned world-class experts, including Frank Hoffman, Daniel T. Lasica, George Davis and David Kilcullen (USA) and Frank van Kappen (the Netherlands).

Journalist Frank Hoffman defines hybrid warfare as any action of the enemy, that instantly and coherently uses a complex combination of authorized weapons, guerrilla warfare, terrorism and criminal behaviour on the battlefield to achieve political goals.

Michael Isherwood in the book *Air power for hybrid war*, which was published by the Mitchell Institute of the Association of the U.S. air force in 2009, gives the following interpretation of the *hybrid war*: it is the war that erases the difference between a pure conventional war and a typical irregular one [5].

Nathan Fryer from the Strategic and International Studies Center was one of the key individuals who identified the threat, which a hybrid war contains: 1) traditional; 2) non-standard; 3) catastrophic terrorism; 4) explosive, when technology is used to counter the superiority in military power.

Characteristic features of *hybrid wars* are the following: aggression without a formal Declaration of war; the concealment of the aggressor of their participation in the conflict; the widespread use of irregular armed formations (including formations disguised as civilians); the disregard of the international norms of warfare, current agreements and arrangements by the aggressor; mutual measures of political and economic pressure (for the formal preservation of ties between the two countries); wide propaganda and counter-propaganda with the use of *dirty* information technology; conflict in cyberspace.

In any case, the country-aggressor must be ready to meet with a rebuff from the object of aggression, and the fact that the latter will have the support of other countries and international organizations (including political, economic, informational and military assistance and the imposition of sanctions against the aggressor).

Given the above stated, as well as available experience, the typical *hybrid war* consists of three main stages.

1. The first stage is preparatory. In the preparatory phase (which can last for several years) the leadership of the aggressor country actively involving the security services, take measures for the creation of ideological, political and military prerequisites for future aggression.
2. The second stage is active. At the active stage (it usually lasts about one year) covert aggression against the selected country is conducted, with the purpose of achieving the objectives.
3. The third stage is the final. At the final stage (duration is not limited) the aggressor strengths its positions in the country-object of the aggression.

Nowadays this term has three branches. Hybridity may relate primarily to military situations and conditions; secondly, to the strategy and tactics of the enemy; thirdly, to the type of forces that the state should create and maintain [4].

In such type of war three types of weapons are used: model-organizational weapons; information weapons (conceptual, methodological, and chronological weapons); material weapons (economic weapons, conventional weapons of destruction and weapons of genocide) [5].

In 2004, on request of NATO a *Multiple Futures* study was carried out to identify trends in the field of international security in general and warfare in particular. In the final report hybrid war was also discussed. As noted by retired Major General Frank van Kappen, this term has many definitions. Further, the discussion was reduced to a purely military aspect and the definition of a hybrid war as a mixture of classical warfare with the use of irregular armed formations. Non-state performers combat missions "can do things that the state itself cannot do, because any state has the obligation to adhere to the Geneva Convention and the Hague Convention on the laws of war on land, and to the agreements with other countries. All the dirty work can be shifted on the shoulders of non-state groups". Psychological and informational aspects are in the field of view of the NATO specialist. So, he stressed that the world community is placed before the fait accompli of aggression and rejection of naming it actually the aggressor. In the short term, this is a very winning tactic [3].

It is worth noting that the idea of hybrid warfare is not new. Military history is replete with examples of asymmetric wars with non-linear tactics and irregular forces, which are the older analogs of the modern hybrid warfare. One may recall Napoleon's war in Spain or the war in Vietnam. Actually, the war in general is not exclusively a confrontation on the battlefield, it includes elements of economic and psychological confrontation, the guerrilla. The ratio and the degree of influence of these components on the overall result, their role and place in the particular confrontation is determined by the level of society development and the spirit of the era. Wars and armed conflicts are spatial and temporal processes, which are based on a variety of contradictions, and the use of multi-scale military forces on the certain areas to achieve certain goals.

In the history of the world there are many examples of *hybrid wars*: the war in Karabakh, the Russian-Georgian war of 2008, the Russian-Ukrainian war of 2014-2015.

Armed aggression of the Russian Federation against Ukraine has become a long-term factor of influence on Ukrainian political, economic, military and social reality. The main goal of the Russian Federation against Ukraine is to weaken and decentralize our state, to bring to power Pro-Russian, Russia-guide government, to derail its European course, returning Ukraine under the control of the Russian Federation [4].

Russia's *hybrid war* against Ukraine is trying to solve several pressing geopolitical challenges.

First, to get rid of a competitor for influence in the post-Soviet space, because only our country among all the post-Soviet states has the potential to compete with Russia in this matter.

Secondly, the hypothetical defeat of Ukraine will significantly demoralize a number of countries in Central and Eastern Europe.

Thirdly, Ukraine irrationally used the potential obtained after becoming independent.

Now Russia is trying to implement the second phase of the *hybrid war* against Ukraine and at the same time (after reaching Minsk agreements) to perform certain elements of the third stage.

Russia uses Eastern Ukraine as a large polygon, which perfects in practice new methods and means of warfare. And it is hard not to agree with the President of Lithuania Dalia Grybauskaite that "Ukraine is now fighting for the sake of the whole world, for all of us. If a terrorist state that is conducting an open aggression against its neighbor is not stopped, it will spread to Europe and beyond."

So, hybrid war is a modern phenomenon. It combines completely different types and ways of warfare that are applied in a coordinated manner to achieve common goals. Scientific advances and technology allow us to wage war in a variety of forms even without its declaration or even without following legitimate standards. The state-aggressor is not an aggressor state, because it does not officially declare the war, but by the hands of others it leads the war. Experts call hybrid war the type of conflict that will increasingly be applied in the twenty-first century.

On a theoretical level a number of concepts of the new generation wars have already been developed. They are space wars, information wars, network wars, cyber-wars which are based on information technology. One of the clearest examples of the new generation war is Russia's hybrid war against Ukraine.

The basis for winning in a hybrid war is good governance in all the components of national security and not just military. Every citizen should be proud of Ukraine. We need to use the phenomenon of Russian-Ukrainian patriotism, which should act as a hidden reserve to relieve tension in an arc of bilingualism, and the promotion of dialogue between different parts of our great country.

REFERENCES

1. Daniel T. Lasica. Strategic Implications of Hybrid War: A Theory of Victory — School of Advanced Military Studies, 2009.
2. Горбунов В. Н., Богданов С. А. О характере вооруженной борьбы в XXI веке / В. Н.Горбунов, С. А. Богданов // Воен. мысль.– 2009.– № 3.– С. 2–25. 6.
3. Корнієнко С. Путін веде в Україні гібридну війну – генерал Каппен [Електронний ресурс]. – Режим доступу: http://www.radiosvoboda.org/content/article/25363591.html.
4. Незалежний аналітичний центр геополітичних досліджень – Електронний ресурс – Режим доступу: http://bintel.com.ua/uk/article/gibrid-war/.

5. Савин Л. Гибридная война. / Информационно-аналитический портал Геополитика. 27янв. 2015 – [Електронний ресурс] / Режим доступу: http://geopolitica.ru/article/gibridnaya-voyna#.VazC1qTtmko.

UDC 172.4

K. Zinkevich, A. Yezhova
Y. Berezyuk, language advisor
Zhytomyr Nursing Institute

THE EFFECTS OF BIORHYTHM CYCLES ON STUDENTS' CAPACITY

Biorhythm is one of the latest topics in the field of identifying mind's ergonomics. It can be quite effective on reducing incidents and mistakes without any visible reason and on reducing students'sudden performance by identifying the physical, intellectual, and emotional aspects of the individual. The purpose of present research is to study the effects of biorhythm cycles on students' capacity, their emotional and physical state.

Materials and methods: To determine biorhythms 30 2nd year students of Zhytomyr Nursing Institute were studied. It was used a questionnaire consisting of 7 questions, determined by the parameters of biorhythms; a biorhythm calculator to find out the critical days and on the basis of the calculations was plotted individual biorhythms. The tools used in this research include online Biorhythm calculator andquestionnaire relating to designated factors of physical, emotional and intellectual activity of the students.

Results: of the 30(100 %) students taking a test, only 8 (26.6%) had favorable biorhythms (both emotional, intellectual, physical positive), of the remaining 22, 16 (53,3%) had unfavorable biorhythm (either emotional, intellectual positive or physical negative, or emotional and physical positive but intellectual negative) and 6 (20,1%) had very unfavorable biorhythms (either an intellectual or physical critical day) .

The purpose of this article is to find reasons of negative emotional and physical cycles of biorhythm and ways to change critical days into positive.

In modern life students often interfere with their own body clocks, either deliberately and directly or indirectly and by accident. On the one hand, a student may drink coffee to stay awake at night, but he also may experience a sleep disorder as a result of some other situation, which may or may not be the result of purposeful action.

The causes for interference with a person's body clock may be outside that person's control to one degree or another. The most common disorder of biological clock is studying or preparing for classes at night, for instance, a condition that

almost never suits a human being, no matter how much a person may insist that he is a "night person." Nevertheless, student may be required by circumstances, such as schedule, economic necessity, or part-time job availability. Another example of interference with the body clock would be narcolepsy (a condition characterized by brief attacks of deep sleep) or some other condition that is either congenital (something with which a person is born) or symptomatic (a symptom of some other condition rather than a condition in and of itself).

There are numerous classes of sleep disorders, among them circadian rhythm disorders—those related to jet lag or work-study schedules. As we have seen, the pineal gland can adjust easily from a natural 25-hour cycle to a 24-hour one, but it can do so only gradually, and it cannot readily adapt to sudden changes of schedule, such as those brought about by air travel. Jet lag is a physiological and psychological condition in humans that typically includes fatigue and irritability; it usually follows a long flight through several time zones and probably results from disruption of circadian rhythms.

What can be done about these common problems related to light and our internal clock, how to change critical days for positive? Melatonin is a hormone released from the brain's pineal gland. It is involved in our internal clock and its secretion is influenced by light-dark cycles. However, taking it by mouth does not appear to be a good solution. Dosages found in over the counter melatonin preparations result in body concentrations that are many times higher than normal levels. It has not been established that such large amounts are safe.

If students follow body's natural cues regarding when to go to sleep and wake up, circadian rhythm should stay balanced, The first thing that should mentioned is to stick to a **consistent sleep schedule.** A regular bedtime is one part of the equation, but waking up at the same time daily will also help keep circadian rhythm in check. It may be tempting to grab some extra shut-eye on weekends, but doing so can throw off body clock during the week.

Next important fact is to spend some time outdoors. In the morning, exposure to the sun, won't just give an energy boost—it can also reset circadian rhythm. A quick outdoor stroll in the morning will give enough sun exposure to signal to brain that it's time to start the day. [7]

Bright lights in the evening hours can throw off body clock by confusing brain into thinking it is still daytime. Artificial blue light (the type that laptops, tablets and cell phones emit) is the worst culprit, students have to try to power-down tech devices at least two to three hours before bed.

Conclusion: Biorhythms, our internal regulatory clocks, have been shown to be an important variable in controlling the day to day functioning of our bodies. The value of biorhythms is large enough in everyday life. Knowing the individual biorhythms can build their plans for the month so that their implementation would have been the most productive. Biorhythms play a big role in the overall well-being and health. It is important to keep a regular sleep schedule and allow plenty of time

for quality sleep, rest and physical activities. Keeping a certain mode that supports biorhythms, a person can stay healthy and young longer.

REFERENCES

1. Chobar DW. Biorhythms and the prediction of educational performance of industrial education students at Wichita State University: Kansas State University; 2000.
2. Levitan RD; The chronobiology and neurobiology of winter seasonal affective disorder. DialoguesClinNeurosci. 2007;9(3):315-24.
3. McConnell JV. Biorhythms: A report and analysis. Journal of Biological Psychology. 1978;20(1):13-24.
4. Pandi-Perumal SR, Srinivasan V, Maestroni GJ, et al; Melatonin: Nature's most versatile biological signal? FEBS J. 2006 Jul;273(13):2813-38.
5. Parikh RH, Askhedkar RD, Singh MP. Biorhythms for accident prevention. International JofMultidispl Research &Advcs in Engg. 2010;2(1):217-32.
6. Reilly T. The body clock and athletic performance. Biological Rhythm Research. 2008;40(1):37-44
7. Srinivasan V, De Berardis D, Shillcutt SD, et al; Role of melatonin in mood disorders and the antidepressant effects of agomelatine. ExpertOpinInvestigDrugs. 2012 Oct;21(10):1503-22. Epub 2012 Aug 9.