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STUDENTS ON THEIR WAY TO SCIENCE
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ELECTRIC VEHICLE HISTORY

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Hybrids and electric vehicles are often described as transportation of the future, but did you know that they shared a similar market part with combustion engines at the beginning of the 20th century when motorization just started? In 1881 first independent electric vehicles were created, but who invented the very first - is uncertain and several inventors have been given credit. England and France were the first countries that introduced electric vehicles. Around 1990s there were electric, steam-powered and gasoline-powered automobiles. Steam engines were reasonably fast and cheap but needed time to prepare vehicles before driving and also stops for getting water. Gasoline-powered vehicles were fast and with acceptable driving distance, but were very complicated, loud and messy. They had average price level. Electric vehicles were slow and expensive, but ecological, quiet and very easy to operate. All three kinds of vehicles had equal chances for development and use in future. In 1904 one third of all New York, Boston and Chicago vehicles were electric [1]. These vehicles were easy to maintain and use, there were even advertisements reflecting that they are so easy to operate, that it can be done even by children or women (internal combustion engines needed hand cranking that led to many injuries). First electric vehicles were more like motorized carriages and were used mostly in cities as taxies. Around 1920 the road network for automobiles started to develop and raised a need for vehicles with longer distance capability. Also invention of the electric starter and low fuel prices led to dominance for gasoline-powered vehicles. Attention was turned to refueling infrastructure, returning to electric vehicles for only brief periods of fuel shortages. The second popularity period was around 1960s when environmental problems gained interest and followed by the 1973 oil crisis. Most electric vehicles were produced for government institutions like post or cleaning. There were five electric vehicles made in Latvia in 1970s by the Riga Bus Factory [2]. Those were made in small quantities and were more experimental. The third popularity wave started around 1990s and it continues till nowadays. Many governments issued regulations requiring reduction in gasoline use, increase of alternative fuels and zero emission vehicles. That led to new models and technologies, but still electric vehicles face similar problems as when they were introduced for the first time. Electric vehicles seem to become some kind of trend- showing their interest in environmental problems. Hollywood stars drive cheap hybrids instead of luxury vehicles and every car company introduces more and more hybrids and electric motors.

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PROTECTION OF ANIMALS BY THE LAW SYSTEM IN THE REPUBLIC OF LATVIA

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Nowadays a lot of people want to own animals such as cats, dogs, rabbits and more, as their home pets and to take care of them, but in the same time, the crimes, made against animals, are increasing. There are several jurisdictions and projects throughout the World carried out, to protect animals from abuse and cruel actions, and countless animals rescuing institutions are established, but the main reason, why the amount of animals-victims is growing, is the fact that society is not well informed, how to help an injured animal, or to who information about criminal actions against animal should be reported.

The Law System in the Republic of Latvia provides a penalty, if a human being has acted with an animal cruelly and in the result the animal died or suffered from physical pain. Most of the cases where animals are being tortured are not finished, due to the lack of evidence.

The structure of the research paper is made of two parts – theoretical basis from the aspect of law and researching morally ethical issues.

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TRACHEID MICROMORPHOLOGY OF SCOTS PINE AND LODGEPOLE PINE GROWN IN LATVIA

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Scots pine (*Pinus sylvestris*) is the most widely spread tree species in Latvian forest stands. Since the demand for wood as a renewable material is increasing, nowadays, search for new sources is under-way. Lodgepole pine (*Pinus contorta*) has been planted and investigated (Sisenis 2010; Jansons 2010) for the last 30 years as an alternative for possible new softwood species in Latvian conditions. The aim of the present research was to study the microstructure of Scots pine and lodgepole pine, and to investigate the differences: 1) within the species depending on the cell location in wood; 2) between Scots pine and lodgepole pine as two competitive species. 32 Scots and 19 lodgepole pine wood samples were collected during 2009 and 2010 from an experimental site in central Latvia, planted in 1985 on dry, sandy soil (*Myrtillosa* forest type). A 2 cm-wide radial strip was cut from each tree disc and divided into three blocks of equal size. Thin cross-sections (15 to 20 μm) were prepared from each block and captured with a video camera, "Leica DFC490," attached to the optical microscope, "Leica DMLB". Cell parameters were measured in 150 latewood and 150 early wood cells of each sample disc by calibrated image analysis software, "Image-Pro Plus". The data were analysed by SPSS. The results show a good separation of the cell dimensions depending on the distance from wood pith, namely, the greater the distance from the pith, the wider tracheids. The cell lumen in early wood and the cell wall in latewood are the main parameters of the tracheid for both species – Scots and lodgepole pine. There are statistically significant differences in all parameters – cell lumen area and lumen diameter, cell diameter and cell wall thickness between the examined wood species. Scots pine is superior to lodgepole pine in the tracheid geometrical size, but it is not an unequivocal indicator for the superiority of the properties of wood and wood products. The main conclusion of the study is that lodgepole pine seems to be appropriate for Latvia climatic conditions as a promising species in the wood product market.

Acknowledgements
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BLACK ALDER WOODLAND KEY HABITAT RELEVANCE IN ZEMGALE

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Black alder (*Alnus glutinosa (L.))* habitats have substantially decreased in Latvia. The main reason was starting of extensive forest drainage. Black alder swamp woods is a special protected habitat type in Latvia and also a prior habitat type in the European Union (Swamp woods, Natura 2000 site code 9080*)(Aunins et.al., 2010). Swamp woodland key habitats occupy 0.3% of the total area of Latvia. In other countries in Europe this habitat type is very rare. Alder swamp forests are wet, adapted to water level fluctuations. Mosaic vegetation and hummocky relief and flooded spaces between the hummocks are related to the characteristics of the typical black alder woodland key habitat (Prieditis, 1997). On black alder woods decayed longs in different decay stages and many woodpecker signs, multi – aged stands are important features. Sun exposed patches and all these different factors provide the spatial structure for species to co – exist. Black alder swamp woods are stable and with specific microclimate, which provides appropriate conditions for unique vascular plant species and mosses species. In the present study, assessment of the edge effect and vegetation diversity on black alders swamp wood key habitats in Zemgale is focused on. The impact of the edge effect on species composition and projective coverage is investigated. The result part shows the dynamics of the amount and composition of the vascular plant species and mosses species regarding to edge of the swamp habitat. As a result of anthropogenic activities (as land reclamation development, felling and others) the black alders woodland key habitats are interrupted by important changes in microclimate. These changes can make big differences and it is working as a threatening factor for special habitat species.

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SLAUGHTER VALUE AND MUSCLE LONGISSIMUS LUMBORUM QUALITY OF CROSSBREED FATTENERS

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For meat industry it is important that fatteners should be characterized by high slaughter value and high meat share in carcass, produced in accordance with the EU regulations about safety food. During four-way crossbreeding programs, through wrong breed pig selection individuals can be obtained with high slaughter value but with muscles having physical-chemical changes.
Meat is considered as normal, when it does not have syndromes of defective meat: PSE, RSE, ASE and DFD (Koćwin-Podsiadła et al., 2005; Fortin, 2002; Pospiech et al., 2006).
The study was performed on 20 crossbreed fatteners about the same final weight in order to check the effect of four-way crossbreeding on the meat quality characteristics. The experimental animals were weighed individually, and then slaughtered according to the Polish standard. After slaughter, pH value, electric potential, muscle *longissimus lumborum* temperature in 1 and 24 hours, were assessed.
The properties of muscle *longissimus lumborum* in the study population of specific genotype were different. The syndrome of poor quality muscle (PSE, RSE, ASE) was observed with: low value pH_1 and pH_{24}, oversized spill juice, strongly differentiated voltage and irregular color of muscles.
In conclusion, three fatteners in the study population were isolated with PSE and RSE syndrome. It accounts for up to 15% of the total.

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WORK DUTIES OF EXTERNAL RELATIONS SPECIALISTS

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Due to the consequences of the continuous globalisation of business most of the companies operate on an international level, as well as the current situation is similar in almost every organization, including institutions based in Latvia, thus requiring external relations specialists that are able to cope with the challenges of establishing international partnerships and continuously ensuring successful cross-cultural communication and cooperation.

The skills needed to cooperate on an international level include the ability to resolve conflicts and the ability to understand the perspectives of others [1].

Thus the external relations specialists have to be able to avoid conflicts and ensure successful cooperation by means of understanding the partner and adapting to them.

Due to the fact that the involvement of organizations in international cooperation is increasing, such cooperation skills for external relations specialists are needed increasingly more, therefore study programs should be adapted, integrating specific skills on the bases of the current job duties of external relations specialists [2].

The observed current job duties in combination with the analysis of the needed competences can provide a basis for simulating the work of an external relations specialist and integrating the simulation into the curricula, thus ensuring more practical experience for the prospective specialists.

In 2011, the most typical observed (from interviews and questionnaires) duties of the Latvian external relations specialists in relation to international cooperation include: telephone communication (proposals, invitations), legal correspondence (requests, proposals), business lunch and meetings with prospective or existing partners; planning and organization of campaigns (advertising); participation in or translation of conferences, planning and organization of special events; other activities to discuss possible partnerships or establish contacts. To successfully prepare the prospective specialists, the aforementioned simulation should be carried out by means of integrating activities that involve the previously listed duties in all possible communication classes, ensuring the communication environment typical of all major cultures rather than only British or American cultures, as it is the only way to practice actual communication and gain useful experience in international cooperation.

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EVALUATION OF IMPLEMENTATION OF DETAILED PLANS

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Detailed plan is a plan of a part of an administrative territory of the local municipality, which is created in order to establish requirements to the utilization of the specified land parcels, and to the building parameters, as well as to concretize the boundaries and restrictions of the land parcels [1].

The Cabinet of Ministers defines the content of territorial plans and detailed plans, the procedure of their development, approving and financing [2].

In the research the detailed plan created in 2004 on the territory of the real property “Luabauši”, which is located in Olaine local municipality is analysed. The detailed plan covers two land parcels with a total area 42.1 ha. 190 new land parcels (building plots) are planned there. Most of them are intended for constructing of dwelling houses for single and two families, one land parcel – for a multi-storey dwelling house, one land parcel – for public and commercial objects.

During the research the graphical and writing part of the detailed plan of “Lubauši” was compared with the real situation. The results of the analysis demonstrate that the objectives of creating the detailed plan to ensure rational utilization of the territory and a good quality of life environment for people and society, in general are not achieved.

There were planned 16 and 19 meters wide streets with carriageway 7 m of width and sidewalks1.5 m of width, but they are not constructed. Public and commercial objects for public needs are also not constructed yet.

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CORPORATE SOCIAL RESPONSIBILITY NOWADAYS IN BUSINESS

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In the middle of the 20th century, globalization was mainly driven by global multinational corporations based in the United States. These enterprises in our modern service society are rather social organizations than economical or technical systems. Their task is not only provision of services or products, but also ensuring brand awareness and prestige. The opinion of the society about a "good" enterprise has recently changed a lot. Corporations pay more attention to social and moral values [2]. In the 21st century, this idea has become even more popular. A modern, competitive corporation is unable to ignore such areas as safety, health, environment, and conditions at workplace.

Currently this is one of the main discussions in the business world. Therefore, there are many different views on Corporate Social Responsibility (CSR), its usefulness and application. While a part of the society treats corporate social responsibility positively (as a way of improving the world), others perceive it as a marketing trick that endangers the profits and even existence of the company. For example, Joel Bakan agrees that corporate social responsibility is a businessmen's new creed. However, he is sure that corporations have not changed and they are not capable of CSR, and are even "psychopathic" [1].

CSR in Latvia became a more urgent matter after the accession to the European Union in 2004, but events that promote the actualization of CSR in the Latvian management were organized also before. In 2001, UNO organized a discussion about the significance of the Latvian management sector in the development of the society. For example, CSR politics of the enterprise "Latvenergo" describes the attitude towards stakeholders such as employees, shareholders, the society and the environment, as well as shows the willingness of the enterprise to voluntarily act with the aim of achieving welfare for the society and improvement of the environment [3].

It can be concluded that there are many pros and cons of CSR; therefore, it is impossible to say whether it is a positive or a negative aspect as regards actions of corporations. There is no need to say that nowadays corporations have great power over the world, thus ensuring benefits for the society, if this strength is oriented towards the right direction. However, this power is not sustainable, due to the fact that corporations will help only to a certain extent – while it is profitable for them. Nevertheless, to some extent enterprises should comprise CSR in their business strategy always.

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EVALUATION OF NUTRITION VALUE OF WILD GAME MEAT IN LATVIA

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In recent years the consumption and assortment of game meat products has significantly increased. Deer farms have come in view. Investigations in the biochemical composition of game meat are few. Therefore, the aim of the research was to evaluate the nutrition value of game meat in Latvian farms and wildlife.

The investigations were carried out in different regions of Latvia. Chemical analyses of 68 samples were done, i.e., elk (8), wild deer (18), farm dear (12), roe deer (16), wild boar meet (12) samples after hunting in Vidzeme and Latgale regions in Latvia were collected. In the studied samples protein and amino acids, fat and fatty acids were determined.

Protein in its content varies among the meat animal species, its content ranges between 13 and 23% of the fresh weight [1]. The amino acid profile is important because some amino acids cannot be synthesized by humans and therefore must be supplied in the diet. The content of protein in the samples of game meat was 22.21 – 23.59%, the richest were the samples of elk meet. The sum of essential amino acids in the game meat samples was determined from 27.06 – 45.70 g 100 g^1.

Meat of wild animals is more favorable for human health because it has a lower saturated fatty acids content but a higher content of polyunsaturated fatty acids [2]. From the results of our investigation it was concluded that the content of saturated fatty acids was lower in comparison with the meat samples of wild deer 33.6%, while in the meat samples of farm deer 41.2% respectively. The British Department of Health suggests the ratio of polyunsaturated fatty acids ω-6 / ω-3 lower than 4 [3]. From the results of the investigation we can see that all meat samples of elk, deer and roe deer have the ratio 1,1 – 1,4.

The results of our evaluation showed that the nutrition value of wild game meat (except for wild boars) was higher than of beef and pork.

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PECULARITIES OF BIOLOGICAL TREATMENT PLANTS OF DOMESTIC WASTEWATER FOR PRIVATE HOUSES INFLUENCING WATER QUALITY

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Biological treatment plants of domestic wastewater for private houses, their specifications and the most important parts of the equipment influencing the water quality are reviewed in the article. The results of the applied research executed to assess the efficiency of the treatment plant construction are presented.

Wastewater is used water from household or industry. It includes substances such as human waste, also surface wastewater off the roof, from the yard, etc. Wastewater pollution is estimated by emission of organic materials in one liter. Treatment facilities of domestic wastewater are used to ensure the quality of the cleaned water. Equipment is installed where there is no possibility of connection to centralized sewage networks. Biological treatment plants of domestic wastewater are intended for treatment of domestic or similar wastewater from the kitchen, bathroom, toilet and other similar - purpose facilities. The treated wastewater may be safely released into the surface waters or into the ground (through the filtration field or ground water catchment). Also it may be directed into the ditches on the roadsides or open water pools. It may be utilized for secondary use, too.

The enquiry method was used for the research. A questionnaire involving the peculiarities of treatment plants of domestic wastewater was worked up. Analysing scientific resources, the construcion of a domestic wastewater treatment plant, its operation and importance in reducing water polutants were examined.

The construcion of the equipment, its operation principles and importance in treating domestic wastewater were annotated. Furthermore, research data analysis was executed and conclusions were formulated.

The research results revealed that domestic wastewater treatment plants existing in the market differ in treatment technologies, parameters and maintenance costs. An essential part of the biological treatment plant of domestic wastewater is a diffuser and aeration chamber; the efficiency of water treatment depends on the supplied oxygen, active sludge and aerobic micro organisms.

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RENEWABLE ENERGY: WAVE POWER

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Even as a small child I have expressed an interest in energy, which are harmless to the world and its development. So I think that it is great that we can use the seas and oceans (without polluting them) and generate electricity, which then can be used in our everyday lives.

Wave power is the transport of energy by ocean surface waves, and the capture of that energy to do useful work — for example, electricity generation, water desalination, or the pumping of water (into reservoirs).

Wave power is distinct from the diurnal flux of tidal power and the steady gyre of ocean currents. Wave power generation is not currently a widely employed commercial technology although there have been attempts at using it since at least 1890. In 2008, the first experimental wave farm was opened in Portugal, at the Aguçadoura Wave Park.

The first known patent to utilize energy from ocean waves dates back to 1799 and was filed in Paris by Girard and his son. In the 1980s, as the oil price went down, wave-energy funding was drastically reduced. Nevertheless, a few first-generation prototypes were tested at sea. More recently, following the issue of climate change, there is again a growing interest worldwide for renewable energy, including wave energy.

Wave power devices are generally categorized by the method used to capture the energy of the waves, by location and by the power take-off system. Method types are point absorber or buoy; surfacing following or attenuator oriented parallel to the direction of wave propagation; terminator, oriented perpendicular to the direction of wave propagation; oscillating water column; and overtopping. Locations are shoreline, near shore and offshore. Types of power take-off include: hydraulic ram, elastomeric hose pump, pump-to-shore, hydroelectric turbine, air turbine, and linear electrical generator. Some of these designs incorporate parabolic reflectors as a means of increasing the wave energy at the point of capture. These capture systems use the rise and fall motion of waves to capture energy. Once the wave energy is captured at a wave source, power must be carried to the point of use or to a connection to the electrical grid by transmission power cables.

In conclusions I can claim that that wave power is one of the best and most environmentally friendly forms of energy.

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SOLAR CELL PHONE TOWERS

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Nowadays there are thousands of companies that provide cell phone services across the world. Inalienable parts of this system are cell phone towers. With telecom operators looking to expand operations all over the world, especially in rural areas, even more telecom towers are set to come up.

Mobile networks require massive amounts of energy to serve all the cell phone customers. For instance, places like Africa and Asia where their lack of a reliable power infrastructure means that many operators are dependent on internal-combustion-engine-driven generator sets to keep their networks up. That is obviously neither good for the Earth (carbon emissions) nor in terms of reliability (greater consumption of fossil fuels).

Because of the increase of fossil fuel prices, any change in the power generation method of cell phone towers would make a tremendous impact on both resource saving and reduction in carbon emissions.

The solution for this problem is to green cell phone networks with solar powered cell phone towers. Currently it would require serious investments but in future it would pay off. Also it would be a significant step towards renewable energy standards set by the governments of countries. In certain developing regions, solar-powered base stations can also be economical. When the network demand is not that strong it could even feed power back to the local utility company that can then sell it to the customers.

It can be concluded that this kind of renewable energy can be applied for reliability and energy autonomy in problematic areas which have no access to electrical grid or can be used as backup power. Of course, at the present moment it is very expensive to build these kinds of systems but in near future it could become a really beneficial way how to provide cell phone towers with electricity.

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AUTOMATIC CAR PARKING SYSTEM IN CITIES

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Currently there is a growing problem of car parking in the city, because the number of cars is growing, but new parking lots are missing. It is becoming increasingly difficult to find a parking place for your car when you need a quick and orderly parking of the car.

Active automatic car parking system. The car driver must turn on the program. The corners of the car are equipped with ultrasonic sensors. The sensors capture the environment of the left and right side and look for a suitable parking space according to the length and depth. When the system finds a place it warns the driver on the dashboard and audible alarm. Car drivers have to stop the car and turn on the reverse gear. The driver only needs to accelerate and operate the brakes. The parking system takes over control of the steering wheel and drives the car to the chosen location. Ultrasonic parking sensors and the parking system inform the driver about the distance in front and back of the car. The sensors send information to a control unit which monitors the parking area and selects the optimal driving path. From the control unit the data are sent to electronic power steering, which controls the steering wheel and wheel rotation.

Findings. Automatic car parking system is very useful for entry into tight parking places and helps evaluate and detect the available parking space size. Currently, automatic car parking systems in cars are fitted as an optional extra.

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AUTOMOBILE SAFETY

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Automobile safety is the study and practice of design, construction, equipment and regulation to minimize the occurrence and consequences of automobile accidents [1].

As the number of cars is increasing every year, car safety is a very important thing to look at.

People have poor information about car accidents and cannot objectively rate how safe their car which they own is and for many also the driving skills are not so good to drive safe. But if people drive a car every day, there is a big risk to get in a car accident.

Many accidents happen on roads every year. Car accidents take many people lives.

In many cases these who make cars think how to make a vehicle cheaper and about fuel economy but safety takes the second place, especially in small cars.

Volvo is always one step ahead compared with other car manufacturers. In their company Nils Bohlin invented safety belts which are in all nowadays cars. *Volvo* also has a modern crash test laboratory and they have been also known for their strong car body structure.

Since the end of the 90-ties all European cars are rated by the company *Euroncap* which gives rating for all new cars, so car buyers can get information about a car which he/she likes and see if it is safe enough.

Euro NCAP organizes crash-tests and provides motoring consumers with a realistic and independent assessment of the safety performance of some of the most popular cars sold in Europe. Established in 1997, Euro NCAP is composed of seven European Governments as well as motoring and consumer organizations in every European country [2].

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SOLAR CELLS

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A solar cell is an electrical device which directly converts sunlight into electricity.

Solar cells are based on semiconductor physics, namely P-N (Positive-Negative) junction photodiodes with a very large light- sensitive area. The photovoltaic effect, which causes the cell to convert light directly into electrical energy, occurs in three energy-conversion layers.

The first of these three layers necessary for energy conversion in a solar cell is the top junction layer (made of N-type semiconductor). The next layer is the core of the device; this is the absorber layer (P-N junction). The last one is the back junction layer (made of P-type semiconductor).

In the result, solar cells in larger systems, like solar panels, turn photons from the sun into DC (direct current) electricity. Then an inverter or breaker panel (it takes the solar array DC power and transforms it into house and utility grid 120 Ac 60(50) Hz electricity) turns DC into AC (alternating current). The production meter measures how much energy the solar system produces and sends it to your home electrical panel.

There are several kinds of solar cells:

- An individual cell – usually small, typically producing about 1 or 2 watts of power;
- Modules – layer units of individual cells;
- Arrays – layer units of modules, which can be interconnected to produce more power.

Solar cells primarily are manufactured in Japan, Germany, China, Taiwan and the USA. Solar cells are used in different kind of systems, e.g., a standalone system does not have a connection to the electricity, it recharges from sunlight. This system varies widely in the size and application from wristwatches, calculators to remote buildings or spacecraft. The generated power is stored and buffered with a battery. A grid connected system is connected to a large independent grid and feeds power into the grid (buildings, rooftops).

Most commercially available solar panels are capable of producing electricity for at least twenty years. The typical warranty given by panel manufacturers is over 90% of the rated output for the first 10 years, and over 80% for the second 10 years. Panels are expected to function for a period of 30 to 35 years.

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BEANS AS IMPORTANT SOURCE OF DIETARY FIBER

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Dietary fiber consists of the remnants of edible plant cells, polysaccharides, lignin, and associated substances resistant to digestion by the alimentary enzymes of humans. Total dietary fiber is the analytical term for dietary fiber that includes both water-insoluble dietary fiber and water-soluble dietary fiber. Insoluble fiber consists mainly of cell wall components such as cellulose, lignin, and hemicellulose present mainly in wheat, most grain products, and vegetables. Insoluble fiber shortens the bowel transit time, increases fecal bulk, and renders feces softer. Soluble fiber consists of noncellulosic polysaccharides such as pectin, gums, and mucilages found in fruits, oats, barley, and legumes. Soluble fiber delays gastric emptying, slows glucose absorption, enhances the immune function and lowers serum cholesterol levels. It is to a large degree fermented in the colon into short-chain fatty acids, which may inhibit hepatic cholesterol synthesis [1].

The dietary fiber hypothesis implies that a high intake of fiber-containing foods is directly related to, or is associated with, a low incidence of many disorders and diseases common with the Western lifestyle (e.g., chronic bowel disease, diabetes, coronary heart disease, and colon cancer).

Dietary fiber intake should range from 20 to 35 grams per day or 10–13 g per 1000 kcal for optimal benefits. The ratio between soluble and insoluble fiber is 1 to 4, e.g., 2.5–3.3 g per 1000 kcal of soluble fiber and 7.5–10 g per 1000 kcal of insoluble fiber [2].

Beans are a legume high in starch, protein and dietary fiber, and are an excellent source of iron, potassium, selenium, thiamine, pyridoxine, and folic acid. The mean value of soluble fiber in cooked chickpeas is 1.5 g 100 g^{-1}, black beans – 2 g 100 g^{-1}, navy beans – 2 g 100 g^{-1}, pinto beans – 2 g 100 g^{-1}, kidney beans – 3 g 100 g^{-1} and lima beans – 3.5 g 100 g^{-1} [3].

Compared to other soluble fiber sources beans take the lead.

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ИСПОЛЬЗОВАНИЕ ЗЕМЛИ, ПРИНАДЛЕЖАЩЕЙ ГОСУДАРСТВУ И САМОУПРАВЛЕНИЮ В ВОЛОСТИ ЛИГО

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Целью исследования является анализ использования земли, принадлежащей государству и самоуправлению в волости Лиго. Нами в архиве Гулбенского регионального отдела Государственной земельной службы были исследованы материалы о земле, необходимой для реализации прямых функций государства и самоуправления.

Администрация местного самоуправления должна обеспечить выполнение функций, установленных законодательством, с учетом соблюдения интересов жителей государства и соответствующих административных территорий [2]. На основании Закона о Самоуправлениях, в ходе исследования были отобраны земельные участки, которым были присвоены функции. Общее количество земельных участков составило 79, из которых для двадцати пяти не было найдено функций, у пяти – функция отличалась от занесенной в Земельную службу, для остальных сорока девяти найденные функции совпали. Частное лицо не имеет права выкупа земли (в сельской местности), находящийся во владении самоуправления и не записанной в земельной книге, а также земли, которая находится в использование государственными учреждениями [1].

В работе также рассмотрена невыкупленная земля, предоставленная в использование частым лицам и процесс приватизации и конфискации земли. Закон регулирует права государства и самоуправления на земельные имущества в земельной книге, а так же использование земли, до утверждения прав на имущество в земельной книге [3].

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IMPOTANCE OF CITRUS FLAVONOIDS IN HUMAN NUTRITION

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The beneficial effects of the Citrus fruits can in particular be attributed, not only to the vitamin C, folate, dietary fibre and carotenoids, but also to the phytochemicals, especially to their flavonoids widely contained citrus fruits (Yao et al., 2004). Citrus flavonoids play an important role in the prevention of degenerative and infective diseases. Flavonoids are a widely distributed group of polyphenolic compounds with antimicrobial, anticancer, antiatherogenic and anti-inflammatory properties (Tian, Q., Miller E.D., 2001).

According to their molecular structures, flavonoids are divided into six classes: flavones, flavanones, flavonols, isoflavones, anthocyanidins and flavonols (Tripoli et al., 2007). Anthocyanins, flavones, flavonols, and flavanones are grouped under flavonoids. Flavonoids contain a $C_6 – C_3 – C_6$ carbon skeleton with sugar moiety (in glycosides). The major glycoside flavonoids in citrus are hesperidin, naringin, and neohesperidin (Milid, Ladaniya, 2008). Citrus flavonones are present in the glycoside or aglycone forms. Among the aglycone forms, naringenin and hesperedin are the most important flavanones.

Compounds such as hesperidin, quercitin, rutin, and eriodictyel have been found to decrease the fragility of capillaries in animals, and could have therapeutic value (Milid, Ladaniya, 2008). Miyake et al. (2000) made a study in viro, using the plasma of rats and human intestinal bacteria, in order to estimate eriocitrin metabolism. In further experiments of Miyake et al. (2006) metabolites in plasma (after ingestion of flavanone glycosides and their aglycones in humans) were shown to exist as the glucuro – and/or sulpha – conjugates of heridictyol.

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COMPARATIVE STUDY OF ANIMAL INTELLIGENCE IN DIFFERENT ANIMAL SPECIES

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Humans used to be considered the only animals on earth that could demonstrate intelligence such as solving problems, communicating with others and memory. This way of thinking has changed. Hundreds of species are able to communicate with each other, such as bees, dolphins, and elephants. Sheep can recognize faces, chimpanzees and other primates use a variety of tools to resolve problems, dolphins can imitate human postures and recognize themselves in a mirror, and bees are able to make and remember a mental map of where sweet nectar is. Animal cognition is the title given to the study of the mental capacities of non-human animals. It has developed out of comparative psychology, but has also been strongly influenced by the approach of ethology, behavioural ecology, and evolutionary psychology. Due to these studies, investigators have proven the capabilities of animals. African gray parrot is not just a surprisingly good talker, but has great memory and ability to understand the concepts of same and different. Modern research has shown that chimpanzees, who could achieve spontaneous solutions to problems without training, were unique to that species, and that apparently similar behaviour can be found in animals usually thought of as much less intelligent. Causal reasoning has also been observed in rooks and New Caledonian crows. Dogs have an amazing part of intelligence, which many of humans do not have – possibility to identify emotions. Dogs themselves have emotions and they are able to tell when someone is sad, stressed or happy without talking to them. They feel bad or evil energy. Animals do not just follow their instincts, they think, count and even speak. They are smarter than we all think.

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MARIE BASHKIRTSEFF ET GUY DE MAUPASSANT

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Deux *â*mes *étranges* et proches *à* la fois, deux grands talents, deux vies courtes aux traces ineffaçables... Marie Bashkirtseff et Guy de Maupassant. Ce sont deux exemples qui prouvent le fait que m*ê*me si la vie est parfois trop cruelle et qu’elle nous *mène* trop vite vers la fin, il faut savoir toujours vivre chaque moment comme si c’*é*tait le dernier, pour donner de la joie et de l’amour, pour en recevoir *à* son tour. Célèbre artiste, peintre et sculptrice ukrainienne, Marie Bashkirtseff (1858-1884) repr*é*sente un m*é*lange extraordinaire de plusieurs cultures (ukrainienne, russe, française), d’une enfant dou*ée* et d’une femme qui est pass*ée* par la vie. C’est ce « grand enfant » qui r*é*ussit *à* attirer l’attention de l’un des plus grands *é*crivains français du XIXème siècle, Guy de Maupassant.

Maria Bashkirtseff, bien qu’elle sache qu’elle va bientôt mourir, ne perd aucun instant pour profiter de la vie afin de laisser quelque chose après elle. Son journal, et sa correspondance avec G. De Maupassant, t*é*moignent l’identit*é* de cette personne extraordinaire, sa soif pour le savoir, et son d*é*sir ardent de vivre ! Vivre pour cr*é*er, vivre pour les autres, vivre pour aimer... La correspondance entre ces deux âmes errantes a l’allure d’un petit roman *é*pistolaire dans lequel l'un (Maupassant) voulait séduire, conquérir, et l'autre (Marie Bashkirtseff) s'en tenir aux plaisirs de l'intelligence. C’était d’ailleurs un jeu épistolaire où chacun, suivait ses propres r*è*gles et ses id*é*es, sans faire l’effort de comprendre l’autre. L’*é*chec *é*tait in*é*vitable. En *é*crivant *à* Maupassant, Bashkirtseff cherche pourtant *à ê*tre d*é*couverte, malgr*é* le masque, *à* se faire admirer en tant que femme et artiste, mais sa pr*é*occupation principale *é*tait, dès le d*é*but, de trouver une personne *à* laquelle elle pourrait l*é*guer son journal : « J'ai voulu nouer des relations par lettres avec un jeune *é*crivain de talent afin de lui l*é*guer mon journal par testament ... mais il s'est montr*é* assez sot... » En ce qui concerne Maupassant, il voit en elle un *ê*tre bizarre et mystérieux. C’*é*tait, peut- *ê*tre, *à* cause du fait que l’*é*crivain jouissait de son succès *à* cette *é*poque-là et qu’il avait beaucoup de femmes inconnues qui lui envoyaient des lettres. Pourtant, il sentait que cette femme n’*é*tait pas comme les autres.

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ФОРМИРОВАНИЕ ЭСТЕТИЧЕСКОЙ КУЛЬТУРЫ СТАРШИХ ШКОЛЬНИКОВ ВО ВНЕУРОЧНОЕ ВРЕМЯ

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Основной задачей современного образования является формирование всесторонне развитой личности. Формирование эстетической культуры учащихся – достаточно сложная педагогическая задача. Простейшие эстетические представления и суждения формируются уже в начальных классах. Однако основная работа осуществляется со старшими школьниками, которые обладают для этого необходимыми способностями к более глубокому пониманию искусства и более развитым чувством прекрасного.

Оценивая роль эстетического воспитания в развитии подростков, в целом можно утверждать, что оно способствует формированию их творческого потенциала, оказывая разнообразное положительное влияние на развитие различных свойств, входящих в творческий комплекс личности.

Сложные задачи формирования эстетической культуры не могут быть решены только во время учебного процесса. Важную роль в системе эстетической культуры играет внеклассная и внешкольная работа.

Формы внеклассной работы очень разнообразны. Это кружки художественной самодеятельности, утренники и вечера, праздники песни и танца, фестивали искусств, факультативные занятия, классные часы, выставки, лекции-концерты, экскурсии и походы, посещение театра и кино.

Внеклассная и внешкольная работа формирования эстетической культуры становится эффективной, в том случае, если она вписывается в целостный учебно-воспитательный процесс. Путем внеклассных мероприятий расширяется кругозор учащихся, их знания, развиваются творческие способности, прививаются практические умения и навыки.

Таким образом, эстетическое воспитание, являясь одним из компонентов целостного педагогического процесса, призвано сформировать у школьников стремление и умение строить свою жизнь по законам красоты.

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SHOCK ABSORBERS

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Shock absorber is an important part of an automobile - a mechanical device designed to smooth out or damp shock impulse, and dissipate kinetic energy. The main functions of a shock absorber are to provide tires contact with the road and ensure safe driving, as well as to absorb or dissipate energy [1].

Shock absorbers are engineered for various purposes. They are designed in various shapes and sizes for meeting the needs of the different industries [2].

Shock absorbers play a very important role – they improve not only comfort but also help in handling of machines and improving stability. Shock absorbers ensure a better tire grip turning, thus guaranteeing better handling and more efficient braking [3].

Usually the first external characteristic that could indicate a failure in a shock absorber is that the car is "rolling". Shock absorbers wear occurs gradually and imperceptibly, so that the rider can ignore the time and slowly get used to the machines increased rolling and lower running [4].

Shock absorbers work on the principle of fluid displacement and heat convection. By forcing a piston through oil, shocks develop the hydraulic friction necessary to oppose the unwanted bouncing in the suspension. The hydraulic fluid located in the damper body, is forced through tiny holes (orifices) in the piston head as it compresses or rebounds. However, the orifices let only a small amount of fluid through the piston, which slows down spring and suspension movement. There are several types of shock absorbers classified according to the configuration and usage, e.g.: Twin Tube Gas; Foam Cell; Mono Tube; Twin Tube Hydraulic; Air Shocks; Shocks with Reservoirs [2].

For security reasons, experts recommend shock absorbers checked after every 20 000 km or once a year [4].

Analysis of different observations shows that the performance is improved, if the checks occur regularly as recommended. Similarly experience shows that the most common types of shock absorbers are the most trustable as well.

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ED (LIGHT- EMITTING DIODE)

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A light – emitting diode (LED) is a semiconductor light source that consists of a chip of semiconducting material doped with impurities to create a p-n junction. LEDs are used as indicator lamps in many devices and are increasingly used for other lighting. Popularity of LED is linked with its efficiency. LEDs emit more light per watt than incandescent light bulbs. Their efficiency is not affected by the shape and size, unlike fluorescent light bulbs or tubes. Although LED is more expensive than incandescent and fluorescent light bulbs, it repays its price in about 200h of use and its working time is at least 3 times longer comparing with fluorescent bulbs and at least 35 times comparing with incandescent bulbs. Nowadays LEDs are used in very wide ways, like street lighting, indicator lamps, displays, car lights, making visual shows etc. As Germany is going forward to close all nuclear power plants, so the reduced electricity amount will put people save energy and using LED will be a great chance to do that.

The start of LED history can be dated in 1927when Russian Oleg Vladimirovich Losev reported creation of the first LED, but no practical use was made of the discovery for several decades. In 1961 American experimenters Robert Biard and Gary Pittman, working at Texas Instruments, found that GaAs emitted infrared radiation when electric current was applied and received the patent for the infrared LED. The first practical visible-spectrum (red) LED was developed in 1962 by Nick Holonyak Jr., while working at General Electric Company. Holonyak is seen as the "father of the light-emitting diode". The development of LED technology has caused their efficiency and light output to rise exponentially, with a doubling occurring about every 36 months since the 1960s.

Although popularity of LED is different in each country, at developed countries it is already wide spread and other countries are following this example, because saving electricity is getting more important every year and LED is lighting for future because of its great properties.

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USE OF HEAT ACCUMULATION IN HEATING SYSTEMS OF DWELLING HOUSES

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Today there is very urgent alternative energy use, especially for heating systems. Over the past years, the theme of heat accumulation and thermal batteries is becoming increasingly important.

To accumulate a certain amount of heat produced by the heat generator thermal batteries are used.

The heat accumulator is with thermal insulation covered tank in which the fluid collects heat. The heat accumulator is added to any wood or solid fuel boiler and installed mainly in private houses.

The function of the heat accumulator – the heat accumulated in the heat battery is used for heating premises which can be very efficiently used for heating automatics (by maintaining the set temperature in every heated room).

Using thermal batteries in heating systems, three main factors that characterize the role of accumulation tanks can be listed - boiler conservancy, fuel economy and comfort.

The first factor - boiler conservancy.

Firewood contains many substances, including tar, acids, etc., which are released when burning firewood. To ensure the quality of all these substances and to reduce the burning furnace of metal corrosion, the boiler should always operate at full capacity, which can be achieved if the heating system is composed by installing heat-intensive batteries.

The second factor - fuel economy.

Operating the boiler at full capacity, in contrast to the popular belief among the people, fuel economy is obtained. This conclusion is easy to justify sinse: if the boiler is operating at full capacity, all of the volatile substances emitted from wood burn completely and return heat to water.

The third factor – comfort.

Comfort because of the reduced frequency of firing times as the heat battery capacity can be selected so that it should be heated once a week and more often only during the critical low outdoor air temperature.

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RESEARCH ON BURNING OF PEAT GRANULES IN GRANULE BURNERS

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Alongside with the increase of the price of wood-pulp granules, there are other types of fuel used more often for heating. The peat granules are becoming one of the most important types of fuel in Latvia[1]. In order to burn the peat granules efficiently, it is necessary to adjust the granule burner of prefurnace. In order to reconstruct the universal granule burner, there was an experiment carried out by burning the peat granules.The aim of the experiment was to study the characteristics of burning of peat granules and melting of ashes in order to design an appropriate granule burner of a new construction.

There was a fireplace burner used for the research purposes. At each stage of the experiment there was 1 kg of peat granules weighted, having the diameter of 8 mm; the digital scales “Sartarius GM312” were used for weighing. The data of the experiments were registered by means of Pico logger TO – 08 that reads the data of the temperature sensor 80PK-22.

While burning the peat granules at constant air adjustment, the burning temperature was measured and registered. The thermocouple 80PK-22 was placed in the burning area of granules.The burning temperature was observed to be very mercurial, having sharp temperature fluctuations.The fluctuations of temperature are shown in Figure 1.The most significant fluctuations were observed at the moment, when the 100g granules were added. The average burning temperature was 800^{o}C. When 1 kg of peat granules was burnt, the amount of ashes was 4.4%, and 31% of them were the crystallized ashes.

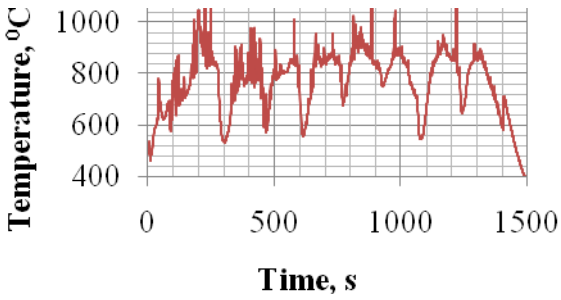

Figure1. Characteristics of temperature of peat granules

When burning peat granules, it is necessary to carry out the preheating of the granule burner in order to reduce the fluctuations of temperature.The crystallization of ashes influences the functioning of the burner unfavourably; therefore, it is necessary to perform automatic cleaning of burner ashes.

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FIELD SPRAYER QUALITY INSPECTION

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The first reference to crop protection equipment is dated in the second half of the 19th century [1]. From that age until recent years the evolution of crop protection equipment in the developed countries had two fundamental objectives: the adaptation of the machines to the needs of applying the chemicals available on the market and the need to improve their working capacity [2]. And it is the reason to search in the field sprayer quality inspection.

Due to the growing attention related to the environmental aspects and with the enforcement of the new EU Directive on the Sustainable Use of Pesticides, it is expected that, in the near future, spray application techniques will receive an important input to improve, in order to satisfy the more severe requirements that are foreseen, especially concerning the prevention of environmental contamination with pesticides [4]. This will involve marketing of sprayers and spraying equipment components. Especially the regular inspection of sprayers in use will provide a stimulus to change the most obsolete sprayers that are likely not to pass the inspection, and to repair the sprayer components that are not functional or efficient. In this sense, considering that in Latvia there are over 8000-10000 [3] sprayers that, according to the new EU Directive, need to be inspected at least once by 2016 and an average inspection failure of 1.5%, it is estimated that about 120-150 old sprayers will need to be replaced with new ones [2].

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TEMPORARY TRENDS OF "NATURE-LIKE" FISHWAYS HYDRAULIC DESIGN

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Nature-like fishways are being constructed worldwide as a fish passage solution that enhances aquatic habitat as well as passes a large variety of fish species and life stages. The design philosophy for these fishways is ecologically minded, aiming to achieve a good fit with the specific riverine environment. This publication gathers photographs from multiple nature-like fishways that have been constructed around the world, lists significant design data and research. The goal is to supply designers and people faced with fish passage decisions with illustrations of the many nature-like fishways already constructed to encourage this type of innovative thinking and nature-like design approach, when feasible.

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INDUCTION MOTOR HEATING UNDER OVERLOAD CONDITIONS

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In agriculture induction motors are used for water supply, food preparation and distribution on farms, milking and milk preliminary treatment, grain treatment, in mechanical and woodworking workshops. In agriculture induction motors are under the following conditions – dust, high humidity and aggressive gases, fast temperature changes and low temperature in winter, high temperature in driers, boiler houses and glass-houses, voltage asymmetry in three phase grids. All these conditions affect the induction motor service life and create induction motor emergency situation preconditions. But the induction motor emergency situations can stop the technological process or a part of the process causing economical loss and it also can harm animal health and even life, i.e., if the ventilation system stops the animals will not get fresh air. Therefore, a need arises to research in induction motor operation and heating under overload conditions that occur in agriculture and to improve the induction motor protection.

A practical research in induction motors was performed at the Latvia University of Agriculture in the electrical drive laboratory. A test bench consisted of an induction motor, direct current generator, dimmers, thermo-couples, electrical measurement devices, data logger and computer. Three thermo-couples were installed in the front windings and three in the back side windings of the induction motor. The thermo-couples were connected to the data logger, which was connected to the computer and the computer was registering the winding temperature measurement. With dimmers that were connected to the direct current generator the load of the induction motor could be adjusted.

The results of the practical research showed that temperature of the induction motor in the front side winding is higher than in the back side. Due to this it can be concluded that the winding temperature measurement devices should be installed in the front side of the motor. Also, these results will be used for future research of the induction motor heating stages to model the induction motor heating process and improve the induction motor protection.

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PROPERTIES OF ASPEN AND ASPEN CLONES GROWING IN LATVIA

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Eurasian aspen (*Populus tremula*) is the second widely spread deciduous tree species after birch in Latvia (57 milj. m^3 in stock) (Forest inventory data, 01.04.2009). Since the demand for wood as a renewable material is increasing, nowadays, search for new sources are under way. Aspen hybrid (*Populus tremuloides* x *Populus tremula*) has been obtained, planted and investigated since 1960's (Smilga 1978) and interests restarts in 1990 with a new point of view and speed in Latvia. In present the hybrid aspen seedlings are available on the market.

The aim of the present research was to find most important differences in physical and chemical properties of Eurasian aspen and aspen hybrid tree and kraft pulp fibres obtained.

97 aspen hybrid and 31 Eurasian aspen wood samples were collected during 2009 and 2010 from an experimental site in central Latvia, planted 1964 and 2000 on agricultural lands with sandy soil (*Myrtillosa* forest type). A 2 cm -wide radial strip was cut from each tree disc and physical properties and chemical content were studied. Images of discs were made by Canon 4400 scanner and measuring of annual rings was performed by image analysis software ImagePro 6 Plus. Content of extractives, lignin and cellulose in wood and pulp have been determined according to TAPPI and ISO standards. Data were analysed using statistical software SPSS.

The obtained results show that hybrid aspen have a greater annual ring width in comparison to Eurasian aspen. It means the aspen hybrids produced more wood in a year, because hybrids had longer growth period. Probably are prone to illness, because they didn't stop vegetation before cold is on (Gailis 2005). Young aspen and aspen hybrid trees show higher paper mechanical properties in comparison with old trees.

The main conclusion of the study is that the private land owners and wood processing experts should pay more interest to the hybrid aspen, as the hybrid aspen is appropriate in the wood product market and characterized by good fibre properties.

Acknowledgements

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SILAGE MAIZE SIZE FRACTION EFFECTS ON BIOGAS PRODUCTION SUBSTRATE QUALITY

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The effect of the corn silage fraction size on biogas production efficiency plays an important role in the field of agricultural biogas plants as energy renewable resources with economical advantages. Within biogas production, it is necessary to distinguish among many starting factors which influence the biogas production. One of these influences is the fraction size of corn silage. It is crucial to know how to improve the production of biogas and increase its potential. In this research project, we focus on three biogas stations owned and managed by agricultural farms that use varying sorts of biological waste and different maize varieties as inputs in order to increase their efficiency of biogas production and thereby also their performance. Each of these stations has 650 MW generators installed. During the year 2012, each of these stations will launch a new 650 MW power generator in addition to the existing one. For these generators, it will be very important to arrange the composition of biological waste as efficient as possible by a mixture of humus and corn silage of appropriate fraction size with high rate of utilization. Identification of all the factors that affect production can help us reduce the substrate requirements, to achieve higher utilization and to help the farms be more independent. Identifying all the factors important for increasing the efficiency of biogas production will lead to a reduction in use of biological waste and to an increase in utilization, as well as to a higher economic independency of farms.

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DESIGN OF MECHANICAL PRUNER SET USED FOR LOW TRELLIS

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Hop fields with low trellis system appeared in the Czech Republic as early as in the middle of the 90s of the 20th century. Hop growing following this technology was tested in 1991 by the Žatec Hop Research Institute, Ltd, but it was not effective. Higher costs of high trellises and lack of labour brought back the question of low trellises. An adequate usage requires corresponding machinery, which presently is not produced.

The main advantage of hop growing on low trellises is the cost reduction. Some experts talk about a cost saving of up to 50%. The cost reduction results from simplification of spring work and from direct harvesting provided by mobile harvesters (straight harvest directly on the field). The saving refers above all to reduction of the necessity of manual work (hanging and anchoring of hop strings, attaching of hop shoots to hop strings, stationary harvesting line operators, etc.) which makes the whole production process more expensive.

Mechanical pruning on high trellis system is provided by hop pruners carried on three-point linkage of the tractor. It is a double-disc constructional solution which is made in two versions (for operation in pole and non-pole rows). The most suitable for low trellises seems to be the variant of a cutting element with a plain disc which is carried on the interaxle carrier. A prototype has already been made by the German research institute Bavarian State Research Centre for Agronomy – Institute for Breeding and Cultivating Plants – Hüll/Wolnzach.

The paper contains an analysis of basic agrotechnical requirements necessary for constructing a mechanical hop pruner for low trellis. On the basis of these requirements a mechanical hop pruner was designed and its virtual model was created. The cutting disc was submitted to a strength analysis FEM (Finite Element Method). Following this analysis the design was completed and the creation of all the necessary working drawings and sets was approached. According to these, separate parts were made and the whole device was assembled. Thus a prototype of a mechanical pruner was created and it will be submitted to experimental measurements as operating in low trellis systems. The paper conclusion presents recommendations for future research.

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RESEARCH IN INFLUENCE OF ADDITIVES OF HEMP WOODY CORES ASH ON THERMAL CONDUCTIVITY OF FOAM GYPSUM

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One of sustainable development key principles is: resources are used efficiently and waste is minimized by closing cycles (Allin, 2005). Therefore, nowadays usage of renewable resources in construction, such as straw and hemp, is very popular. At the manufacturing process waste is generated or substandard quality harvest obtained of this renewable raw material, that are not suitable for construction application, or simply as an alternative application it is their use as a fuel material – for energy production. The combustion process produces ash, which can be useful as filler for building materials (2, 3).

The aim of the present work is to research the influence of additives of hemp woody cores ash on the thermal conductivity of foam gypsum. To achieve this, the different specimen types were prepared – with and without additives. For controlling the ash granulometric composition the sieves were used. By combining the gypsum with varying amounts of ash, varying with the ratio of gypsum and water, as well as the volume of surface active stuff, the specimens with different volume density and coefficient of thermal conductivity were obtained. The coefficient of thermal conductivity was determined using the heat flow meter “Netzsch HFM 436 Lambda”. The results from the specimens with and without additives were compared.

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GAS COMPOSITION CHANGES DURING STORAGE IN SHREDDED CARROT PACKS MADE OF DIFFERENT PACKING MATERIALS

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Carrot is one of the important root vegetable crops, and it is highly nutritious as it contains appreciable amount of vitamins B_1, B_2, B_6, and B_{12}. It also contains many important minerals. Carrots have the highest β-carotene content among human foods, a precursor of vitamin A [1]. Shredded carrots are an increasingly popular product, but their sales are restricted due to rapid deterioration during storage [2]. The ratio of oxygen (O_2) and carbon dioxide (CO_2) concentrations must be defined for each fresh-cut product and for each handling procedure applied (e.g., slicing, shredding, whole) [3]. Therefore, for the producers shredded carrots shelf life extension could be urgent. That is the main target of the present experiments to analyse the packing material influence on CO_2 and O_2 gas changes during storage of packed shredded carrots.

The research was accomplished using fresh in Latvia grown (*Daucus carota* L.) carrots harvested in Zemgale region. Serotinous 'Nante' cultivar carrot hybrids were: 'Nante/Forto'. Peeled, shredded carrots were placed in DuniForm PP trays (138x114x53 mm) by 150±5 g in each. For the tray sealing Duni equipment DF10 with and without perforation roll was used, trays were sealed by PP film of DuniForm (154x400 mm, 42μ) and breathable film obtained from the distributor company FARO. Within the research CO_2 and O_2 gases were analysed using the gas analyser OXYBABY®V. Sample testing was done every three days till the 18th storage day. Shredded carrots were stored in Commercial Freezer/Cooler ELCOLD at temperature +4±1 ^oC (controlled by MINILog, Grainger electronic).

Significant differences in CO_2 and O_2 gases content during the 15 days storage among all packing material samples were found $p<0.05$. The O_2 content ($R^2=0.5592$) was accordingly from 1.4-18.6% und CO_2 content ($R^2=0.7563$) 2.1-20.2%. The obtained results show, that the packaging material obtained from the distributor company FARO is the best applicable for shredded carrot packaging and could maintain the quality till 12 storage days. The mentioned packaging material from FARO could be successfully used for shredded carrot packaging and selling in supermarkets.

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FUEL ECONOMY FACILITIES IN TRACTOR OPERATIONS

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Soil cultivation is one of the most expensive and most power intensity operations in fields for agricultural enterprises. The most power intensity operation is ploughing – 20 – 50 % of total fuel consumption [1]. On some farms the fuel consumption in ploughing has increased since the recent 15 – 20 years for more than 100% if compared to the tractors manufactured in 1995 fuel consumption and the tractors manufactured in 2010 fuel consumption in similar conditions. A newer tractor must be more economical then an older one. And it is the reason to search how farmers can economise fuel in tractor traction works.
Tractors work most effectively if the engine load is approximately 90% of its maximal power. Every 10% of unused engine power increases the fuel consumption for about 4 – 5% [4]. Ploughing with an edgeless ploughshare increases the fuel consumption for about 10 – 15 % [4]. 3mm added to the ploughshare blade thickness increase the traction resistance for about 40 – 60 % [2]. The working speed increase within 5 – 10 km/h for 1km/h in ploughing increases the traction resistance for about 5– 7 % [4]. The engine technical condition affects the fuel consumption. A wrong fuel injection start angle for 2° increases the fuel consumption for about 10 %. High pressure fuel injection pumps with non – return valves worn for 33 - 43µm increase the fuel consumption for more than 30% [2]. The air pressure in tires will effect the fuel consumption: if there is wrong pressure – the fuel consumption increases. The air pressure affects the traction force – if the pressure is right – we can get maximal traction force [3].

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SELECTED PATHOGENS AND BIOLOGICAL THREAT AFFECTING HEALTH OF PLANTS AND ANIMALS

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Among the harmful organisms that threaten the health of plants and animals parasites, fungi and bacteria can be distinguished.

Plant diseases are a serious problem for the agricultural sector worldwide and indirectly to the problem of feeding people, the danger of micro-organisms is important because they can mutate by changing the pathogenic properties, and quickly spread from the original area of occurrence to another free place.

Bacterial plant pathogens are particularly difficult to control because it is prohibited to use antibiotics, which are the only effective means in this struggle. The meaning of this prohibition is not to create resistance against antibiotics; leading to the emergence of resistant forms may also pass the bacteria on human diseases. Bacteria communicate to each such resistance between each other using structures called plasmids by conjugation.

Contamination of food relates to food products that are broken or contain microorganisms such as bacteria or parasites and also toxic substances.

This usually causes discomfort and disturbance of animal welfare. Before the first symptoms appear the disease is always preceded by a period of incubation in the host organism, the incubation time is dependent on the physiological status, age, sex, and above all immunity. During this period, the microbes multiply, divide and break other barrier defenses.

Some types of pathogens produce endotoxins circulating in the peripheral blood of internal organs causing damages penetrating the flesh. The symptoms depend on the type and duration of infection.

Many pathogens cause similar symptoms, although the direct mechanisms are different.

Both, animal and plant diseases, involve measurable costs associated with the loss of crops, damage caused by parasites which affect the quality and price of agricultural products and foodstuffs. Organic food produced without pesticides is most threatened. The costs relating to animals are related to the care of veterinarians, testing of products of animal origin.

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UNUSED AGRICULTURAL LAND IN LATVIA AND EUROPE

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Agricultural land is the most important resource and therefore should be protected and maintained. The major problem in both, Latvia and Europe, is with the agricultural land (hereinafter referred to as AL) areas. AL in the Republic of Latvia occupies almost 2/3 of its total area [2]. Over the past 50 years a large proportion of AL areas have been abandoned. They are overgrown with various shrubs, deciduous trees [5]. Without the use of AL area, the soil agrochemical and agrophysical properties change, lands overgrow with bushes of little value, the drainage system is damaged. Almost 15% or 370 thousand hectares of the Latvian AL is not used, but 20% of them are fully healed [4]. This problem exists also in Europe, it is pronounced in the former socialist countries of Eastern Europe, as well as the arid Western mountainous areas. In the neighborhood in 2002 the dropout rate was 10.3% in Lithuania and 10.1% in Estonia, which is almost half less than in Latvia [3]. Large areas of land which are not managed are not used for agricultural production, so this is not any benefit to the economic system [1].

The research was started in 2011 in the summer and continues even now. For the research the data collected by the training practice “Property management” students and analysis of literature, and the Rural Support Service data for the survey of Latvian AL in 2010 were used. Non-use of land should be imposed, for example, the tax increases or even expropriation, while land use should be stimulated and processed.

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MICROALGAE OIL AS BIODIESEL SOURCE

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Microalgae are small, single – celled organisms. Usually found in damp places or bodies of water. Microalgae can contain 2 – 40% oils/lipids of dry biomass weight [1]. The main microalgae advantage for producing biodiesel is 7 – 30 times greater oil yield per area unit, per year. Compared to the best terrestrial crops and palm oil it would be 20000 – 70000 litres per ha. Microalgae can be grown almost anywhere, even in sewage and salt water. Microalgae farms do not require fertile land, leaving it for growing of food crops [2]. Like all green plants on the earth algae are photosynthetic. That means, by absorbing sunlight, nutrients and CO_2 microalgae produce oils which can be a source for biodiesel production.

For extruding oil biodiesel algae can be grown in open pound systems and photo – bioreactors. Harvesting can be set up continuously or by harvesting a batch at a time. Opened pound systems are much cheaper, but there are water evaporation, invasion threats and local species of algae often overgrow the oily microalgae. The simplest way to extrude oil from algae is mechanical, like for food crops, resulting in 75% extracted oil from the content [1]. Algae oil processes into biodiesel as easily as oil from food crops. The difficulty in efficient biodiesel production from microalgae is finding an algal strain with a high lipid/oil content and fast growth rate. To deliver biodiesel to consumer for competitive price made from microalgae oil there is a lot of work to do to investigate the best performance algae strain and build photo – bioreactors with higher performance.

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AIR QUALITY INFLUENCE ON HORSES HEALTH

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Respiratory diseases are one of the most widespread diseases among horses. Although there are many different opinions about horse training, keeping conditions and feeding, veterinarians, horse owners and professional handlers agree that good air quality inside the horse stable is one of the main factors that affect the horse respiratory system. Even in a new and modern stable horses health is endangered because of dust, ammonia, and hydrogen sulphide that are in the air, and without qualitative ventilation, it can bring to allergies and serious lung diseases such as chronic obstructive pulmonary disease.

One of the best ways to protect the horse health is by providing optimal air temperature, air humidity and moisture of gases. Air temperature is affected by the season, temperatures ranging from 10°C to 24°C can be considered optimum, but the temperature inside should not be dramatically different from the temperature outside. It is better to put a blanket on a horseback than make the animal live in artificial conditions. Too dry air (low relative humidity) dries the horse's nasal mucosa and can be a source of dust and pathogen infiltration into the respiratory system. Very moist air (high relative humidity) combined with low air temperatures can reduce the insulation properties of the horse's hair coat. Accumulation of dust, pathogens and gases from feeding, manure and the horses themselves affect the air quality negatively.

The first rule to control these conditions is cleaning the stable while horses are not there, and let them back few hours after the stable has been cleaned. Those animals, that are tended to have breathing problems, should spend time outside in fresh air as much as possible. In addition, the stable has to be designed professionally to avoid inappropriate conditions. Side-wall opened stables are much recommended to ensure a high quality environmental solution. Healthy respiratory system is one of the first conditions that make horses feel energetic and happy, and it is not so hard to provide the necessary environment. So, let us take care of qualitative air and environment that our horses have to live in.

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BIOINDICATION USAGE IN AIR POLLUTION MONITORING

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The aim of air pollution monitoring is regular and continuous collecting of information about air pollution to prevent pollution associated hazards to ecosystems and their components, including humans. Nowadays, the main technology used for this purpose is electronic sensors. As they are designed for specific measurements, electronic sensors cannot detect unforeseen pollutants and determine the cumulative effect of different pollutants [1].

Therefore, bioindication can be used for pollution level determination using living organisms (bioindicator species). In this way, the pollution level can be estimated more realistic, because the data obtained by bioindication are more easily interpreted in relation to the ecosystem quality or human health [1]. Whatever technology is used – electronic sensors or bioindication methods, one of the most important parts is raw data conversation to practically usable information, like a pollution map which can be used, for example, in the decision making process about pollution reduction activities.

Air pollution monitoring is a long term activity which covers a wide territory – from individual cities and municipalities to national scale. The result is a very large amount of data which needs to be processed [2]. Using electronics based methods, measurements are made automatically and the obtained data are quantitative, digitized information which is easy to process with specially designed software. In contrast, the current bioindication methods need direct human involvement at all stages – from data collection, when information about bioindicator species is acquired, to data processing when information about bioindicator species is transformed to data about the pollution level.

To be competitive in the air pollution monitoring field, the bioindication methods must be adapted for computerized data processing. In this way, due to the bioindication specifics, human involvement is not completely excluded but it is significantly minimized – a large amount of data can be processed faster and therefore competitiveness of bioindication to electronics based methods is increased. Such adapted methods would allow using bioindication in air pollution monitoring effectively and obtain regular, alternative data about air pollution, which in combination with the data acquired by electronic sensors, can more effectively describe the situation in the air pollution field.

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WOOD ASH AS AGRICULTURAL FERTILIZER

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All over the world the demand for renewable energy is increasing. The explanation is very simple – every village, town, or country wants to be independent from fossil fuels. About 10% of the final energy consumption comes from the traditional biomass, which is mainly used for heating. For example, in the capital city of Latvia – Riga the main heat producer "Rīgas Siltums" uses woodchips for heat production and the company wants to expand woodchip use for energy production with the construction of a new, modern biomass boiler house in "Vecmilgrāvis". This is only one of many examples.

Woodchips are a medium – sized solid material made by cutting, or chipping, large pieces of wood. Traditional use of woodchips is as a solid fuel for heating buildings or in power plants for generating electrical power from renewable energy. When wood is used as a fuel in heating systems the formation of an undesirable byproduct - wood ash is unavoidable. An economically efficient and reasonable solution of this problem is using wood ash as a fertilizer in agriculture. Ash could be used as an organic fertilizer in gardens or agricultural fields. If you are an advocate of green living there is no better fertilizer as the ash. It contains no chemicals, only natural substances. Ash from deciduous trees supplies plants with 2%-7.3% phosphorus and 6.9%-13.3% potassium. Birch wood ash contains to 37% calcium, 20% potassium and 7% phosphorus. Ash calcium perfectly neutralizes acid soil. Natural fertilizers can be used for all kinds of soils but you should be careful because you should not use too much ash for alkaline soil. Wood ash can be useful in increasing soil pH and supplying plant nutrients. However, you must follow certain procedures before (and possibly after) each ash application.

Wood ash content: macroelements: calcium (Ca) 26%, potassium (K) 10%, phosphorus (P) 3%. magnesium (Mg) 3%; microelements (mg/kg of dry matter): manganese (Mn) 8, zinc (Zn) 3, copper (Cu) 1.

At present ash application in agriculture is not popular yet. The main reasons are its small quantities and the unsolved technology (collection, screening, fractionation, sowing, and evaluation). But wood ash as a fertilizer has excellent potential because thus it is possible to use effectively heat production emissions for biological agriculture.

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INFLUENCE OF STUDY SUPPORT ON FIRST-YEAR STUDENTS ADJUSTMENT

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The aim of the research is to work out a method of IT integration into the learning process at university in order to facilitate the adjustment of the first-year students. The suggested project is carried out with a help of computer-supported problem-based learning.

The research into the adjustment problems of the first year students (over 200 respondents: St.Petersburg State Polytechnic University and St.Petersburg Military Artillery Academy) detected some problems the students face in the didactic, social-psychological and motivational aspects of adjustment, which result in fatigue, stress, academic disappointment from the initial grades received, feelings of anxiety, hostility, academic inadequacy or inferiority etc.

The suggested project is aimed at coping with the detected difficulties through the *study support* provided to the first-year students in the course of foreign language. The effectiveness of the suggested project “First-year students in Web” is proven scientifically.

The following methods are used in the research: **o**bservation, interrogation, discourse analysis.

It has been found experimentally that the *study support* provided to the first-year students with the help of the suggested project facilitates the process of their adjustment during the transition into university.

Study support provided to the junior students through participation in the computer-supported project work helps them overcome difficulties in the first year of studies.

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SOLAR HEAT FOR GRAIN DRYING

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In many countries of the world the use of solar thermal systems in the agricultural area to conserve vegetables, fruit, coffee and other crops has shown to be a practical, economical and responsible approach environmentally. Solar heating systems to dry food and other crops can improve the quality of the product, while reducing waste and consumption of traditional fuels - thus improving the quality of life, however, the availability of good information is lacking in many of the countries where solar food processing systems are most needed.

Generally, *high-speed, high-temperature drying* is not adaptable to solar energy use for three main reasons: simple solar collectors cannot provide a high enough drying temperature; the amount of the collector surface required to supply all the heat for even a moderate size high-temperature dryer is unrealistically large (nearly an acre); and solar energy is available only when the sun shines. If you already have a large collector, such as a roof unit for warming livestock shelters, it might be used advantageously with high-speed driers to pre-heat the drying air a few degrees.

Low-temperature drying, on the other hand, is quite well adapted to solar energy. Being a slow process which uses natural or slightly heated air to dry the grain while in storage, solar energy can provide the supplemental heat to raise the temperature and reduce the relative humidity of the drying air.

Solar energy is also applicable to *combination high- and low-temperature drying*. Under this system, a high-speed, high-temperature dryer is used first to bring the high-moisture harvested grain down to about 20-22 percent moisture. Then the grain is transferred without cooling to a slow-speed dryer for final drying to its proper storage moisture content, using natural or solar heated air. The aim of this combination system is to reduce grain moisture quickly to a level where cheaper low-temperature drying can be done without danger of undue spoilage.

Solar energy is an excellent alternative source of supplemental heat for low-temperature grain drying systems. Because these systems require only a few degrees additional temperature rise, they are well adapted to the moderate heat increases that solar energy can economically generate.

Solar energy may be used in the low-temperature phase of a combination drying system after the grain is dried to 20-22 percent in the high-speed dryer.

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TYPES OF PEDAGOGICAL SUPPORT OF GIFTED CHILDREN IN SPAIN

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Giftedness was a mystery for quite a long time. Nowadays psychologists are constantly analyzing and generalizing this phenomenon for fostering the talent of children and making its development successful. Spanish scientists are also a part of this process. Moreover, they have worked out ways of supporting gifted children.

Thus, Spanish educators specify the following types of pedagogical support of gifted children:

- acceleration;
- educational enrichment;
- grouping;
- extracurricular enrichment;
- other educational strategies.

Acceleration allows students to enter education earlier than it is stated. There are some kinds of acceleration: “advanced” programs, temporary courses at Universities, summer programs, studying abroad. Educational enrichment presupposes the individualization principle. This principle is implemented in the forms of curricular extension and adaptation of the curriculum according to individual peculiarities of gifted children. Grouping may be of two types: general grouping (special schools) and partial grouping (separate classes, courses or separate groups in the class). Extracurricular enrichment can be realized both in the school network and out of it. It is based in the help and correction of the personality under the conditions of peer existence.

There are some other strategies of pedagogical support of gifted children as well like consulting programs, room of support and resource, independent education program, workshops, contests and so on.

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STYLISTIC FEATURES OF SCIENTIFIC AND TECHNICAL TRANSLATION

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It is necessary for graduates of mechanical engineering studies to master their English for professional purposes. Good knowledge of their professional language improves their qualification and consequently their good positions at the international labor market providing them with adequate social status.

The scientific and technical texts display special features, namely in the category of style. The stylistic features of English and Russian scientific and technical texts have certain differences.

The research is based on the comparative analysis of Russian and English scientific and technical texts, discourse analysis.

To develop professional translation skills one cannot do without the knowledge of stylistics of both languages. English communicative conventions in scientific and technical texts are marked by preference for modal expressions, hedges, indirect expressions, deictics, etc. which are disfavored in Russian texts of this genre [1].

The research has revealed that, in order to become a competent translator in transferring knowledge effectively from one language to another, a university graduate should develop the translation competence. Technical translators often deal with the newest information, concepts and terms, which do not exist in the target language. A university graduate should not only master the target language perfectly but also understand the problem, learn how to express the message in the target language paying attention to the stylistics of the text and be a good specialist in the field.

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IGNITION SYSTEM OF INTERNAL COMBUSTION ENGINE

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An internal combustion engine (ICE) is one of the things which play a significant role in our life. It is used in motorcycles, cars and other vehicles. The ICE consists of many very accurate, small element groups (called systems) and one of these systems is the ignition system. Without ignition there would not be any working engine because ignition sparks cause explosions in combustion chambers and push pistons down, producing energy.

The evolution of the ignition system started in 1780ies when Allesandro Volta designed a toy gun with sparking elements. When the first ICE was designed, this idea was adapted to ignite the fuel-air mixture in the combustion chamber. The first ignition system was a magneto system; it was very simple and reliable and had low weight. The principle was simple – a magnet was turning inside the windings, so electric current was produced there, which was interrupted by a contact breaker. But still there was a small problem – the ignition system did not work well enough at low engine rpm (revolutions per minute). Therefore, engineers combined a battery to this system and the driver could switch between the magneto and battery energy source. In 1910 the first reliable battery operated ignition system was designed. To ensure long travels, the circuit was supplemented with an alternator which charged the battery. This system was the most popular till the 20th century 80ies, when gradually a breakerless (electronic) ignition came in use in every modern engine.

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SOFTWARE INTEGRATED DEVELOPMENT ENVIRONMENT COMPARISON

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Software development is one of the most rapidly developing fields in computer science. The biggest effort has been devoted to abstracting languages and syntactic constructs and to unify more and more development tools to simplify development.

A study with the aim of understanding how older, seemingly outdated, integrated development environments (IDE) compare to new ones was performed. The study was done in the software engineering company „Datorikas institūts DIVI" where the development and maintenance of software products has been done since 1995. Most programmers agreed that what older development environments lack in syntax highlighting, automatic variable definition checking and compilation possibilities of never ones, they still manage to surpass newer environments in such things as ease of reading codes and ease of data manipulations. On the other hand, modern development environments provide such important tools as version control and unit testing as a part of development environment which eliminates the need for the 3rd party providers of the mentioned tools.

The study shows that for small projects older environments still manage to surpass their newer counterparts, but as the projects grow in size, the tools integrated prove to be more useful and outweigh the benefits of their older counterparts.

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CHINCHILLAS – AT ALL TIMES ADORED AND HUNTED

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When Spaniards voyaged to South America close by the Andes in 1524, they soon discovered a small, grey rodent, whose fur due to its softness the native tribe Chinchas used for pelts. Conquistadors were delighted for their discovery and soon brought this new fashion innovation into Europe thus starting the march of chinchilla glory and calamity.

Chinchillas, once introduced to the Old World, soon became the absolute requisite for royalties in the 18th century - the secret of chinchilla fur popularity lies in the fact, that they have the highest fur density of any land animal with more than 20,000 hairs per square cm. While endlessly adored and widely worn in the reigning countries in Europe, at the same time this species was gradually becoming extinct in its very own habitat in Argentina, Bolivia, Chile and Peru because of the excessive and persistent hunting and trapping for fur and meat. In 1918, when laws and prohibitions were finally set up against the unjustifiable hunt, it was almost too late.

In spite of all bans and endangered status of this species, the first chinchilla farm was established in Los Angeles in 1923 thus launching the chinchilla breeding industry worldwide.

Nowadays, this gentle and tame animal is protected by CITES – it is strictly forbidden to trade in wild chinchillas or their fur or hunt them among all the signed nations. Currently chinchillas can be found only in northern Chile, where a whole reservation has been established for the last 6000 savage individuals, and in modern society, this animal is mostly renowned as a pet although its recognition as a fur-bearing animal remains.

Moreover, the fur farming industry has met some changes as well - in the last couple of years the Latvian Fur Breeders' Association in collaboration with EFBA has enlarged the cage standards twice thus improving the farming conditions. However, many farmed chinchillas still suffer from typical captivity breeding illnesses – such as ringworm, barbering and enteritis.

To optimise the breeding on farms and among the private owners a research on thermography has been started. The goal of this study is to determine whether female oestrus can be detected using a thermograph. However, it is still an open discussion whether chinchilla future lies in the meaning of a pet and fur only.

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QUALITY OF MATERIAL DISTRIBUTION IMAGING WITH SEGMENTAL CAPACITIVE SENSOR USING LANDWEBER'S ITERATIVE ALGORITHM

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Yield maps are an important source for practical application of the precision agriculture. Creating of yield maps requires a high-quality system for measurement of the actual yield, preferably during the harvest. In the Department of Agricultural Machines, Faculty of Engineering of CULS the capacitive throughput sensor for plant material throughput measurement has been developed in recent years. It can be used for measurement of the actual yield. However, this sensor (like most other methods used for measurement of actual revenue) has only one output signal from which only the amount of the material can be inferred while its distribution cannot. This fact was the inspiration for the beginning of development of the segmented capacitance sensor (SCS).

This sensor should be able to determine the amount of the passing material and its distribution as well. SCS is essentially a variant of the electrical capacitance tomography (ECT). ECT sensor usually consists of several electrodes arranged around the scanned area [1]. The areas usually have a circular or square shape. The scanning process is performed so that between each pair of electrodes the electrical capacitance, which depends on the position of the electrodes and distribution of dielectric in the scanning area, is measured. SCS is designed for scanning rectangular areas (belt conveyors, for example). The sensor consists of a wide base plate which is earthed and several measuring segments are located above it. The measured material passes between the bottom plate and the measuring segments. The capacity is always measured between one or two segments and the bottom plate. The main advantage over the standard ECT sensors is that the measuring of the capacity proceeds still in the same range so it puts less demand on the measuring circuit. In the present article the quality of image reconstruction of SCS is evaluated using Landweber's iterative algorithm [2]. Two scanning techniques were evaluated: the technique with eight electrodes and eight output signals and the technique with eight electrodes and 56 output signals. A relatively good function of algorithm was proved, however, lower ability of the algorithm to determine the distance of the material from the electrodes was also found. In conclusion it is stated that the Landweber's iterative algorithm can be used for SCS, but it will need modification.

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PLURILINGUISM IN PROFESSIONALISATION: TEACHER TRAINERS' VIEW IN LATVIA

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Plurilinguism and professionalisation are inter-related: professionalisation is based on the linguistic mediation. Moreover, linguistic mediation of professionalisation is placed within the stable understanding of the unity of all languages [2]. Teachers' professionalisation is promoted by language education within in-service training that includes mother tongue across the curriculum, foreign languages and professional language. The aim of the study is to analyze the teacher trainers' view on languages of professionalisation in Latvia. The meaning of key concepts of *professionalisation* and *plurilinguism* is studied. Moreover, the study demonstrates how the key concepts are related to the idea of in-service training and shows a potential model for development, indicating how the steps of the process are related following a logical chain: defining professionalisation → determining plurilinguism → revealing in-service training → empirical study within a multicultural environment. Explorative research aimed at developing hypothesis, which can be tested for generality in following studies [1] has been used. The present research was conducted in Latvia in 2011-2012. The findings of the research allow drawing the conclusion that the teacher trainers' view on languages of professionalisation is homogeneous. In Latvia the teacher trainers focus on English as a foreign language as a language of professionalisation. They do not consider professional language as a language of professionalisation. Directions of further research are proposed.

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INFORMATION SYSTEMS OF STATE LAND SERVICE FOR ENSURING OF REAL PROPERTY ADMINISTRATION

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The State Land Service is the state institution that maintains a number of state information systems, int. al. Cadastre Information System, State Address Register, and others, which support procedures closely connected with real property administration.

Consequently, the mentioned above information systems (hereinafter – IS), their structure and functionality are a fundamental part of real property administration processes and conversely – these processes directly nominate the requirements for IS.

Mutual interaction and cooperation between IS and processes of real property administration can be improved and optimized by the means of business and information technology alignment. In order to improve the outcomes of IS, it is important to find answers on questions like: Do all IS give adequate support and ensuring for all appropriate real property administration processes? Is this support sufficiently effective and optimal? How to improve the situation and escape from detected disadvantages?

These questions can be answered by making conformity assessment of IS and legislative acts and standards in the real property administration field, by measuring satisfaction of the customers and internal IS users, by assessment of human, time, financial resources in development projects of IS.

Topicality of solving the problems mentioned above is defined by the need of improvement of the economic and social situation in Latvia, increase of capacity of state administration authorities and decrease of administrative burden on society.

The issues described above will generate constructive suggestions for development and improvements of IS in accordance with the needs of real property administration processes and corresponding to the best practice and contemporary trends in the IT branch, taking into account that added value must come not just from the selected information technology tools and information systems that are designed and developed, but also in the way that they are intended to use and are used in the processes of real property administration.

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THE VALUES OF "THE WEST" AND "THE EAST" AND THEIR INFLUENCE ON CHINA FOREIGN POLICY ANALYSIS

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Within the social science, and the political science especially, it is always problematic to analyze "the East" from the point of view of "the West", because of several aspects. First of all, the interpretation of political processes looses objectivity because is based on different values of worldview. And secondly, the attitude toward "the East" is politically "value-laden", because it goes beyond the paradigm of democracy and its universal effectiveness.

The author in the report "The values of West and East and their influence on China foreign policy analysis" uncovers what the basic values in western and eastern politics toward politics are and especially analyzes the foreign policy strategy of the People Republic of China. As the research method in the research paper content analysis and discourse analysis is used. The theoretical base for the research is guidelines of constructivism by Nicholas Onuf (particularly on rules, society, speech act, agents and international system). Using the mentioned methodology, the author outlines the specifics of communication between "the East" and "the West" and gives the recommendations how "the West" should understand and interpret China's claims in the international system. In the centre of the analysis of the research paper are writings of Chinese constructivists – those who are drafting foreign policy strategies of China purposely for International society (basically writings by Li Junru, Jiang Xiyan, Shi Yinghong, Liu Yongtao, Yang Jiemian).

An extra additional value of the report is the complete scheme of China's foreign policy concepts outlined in writings of Chinese constructivists that will help for further studies in particular branch and make more perceptible the Chinese way of expression of international rules.

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WORKPLACE VISUALIZATION IN MANUFACTURING

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Workplace visualization is a way how to improve the production volume. In Latvia visual thinking is not popular, because mostly we have basics remained from the Soviet times. But it has been proved that visual thinking helps increase the employees working speed, quality and working conditions.

There are a lot of different types and methods described in books and DVDs which you can buy from companies. But none of these will help improve manufacturing perfectly, because there is a need to take together the whole process of production. From all the existing methods for companies of every industry we should choose and develop one special.

In the present research the best method for metal working companies was developed from five wide - known methods and techniques:

1) 5s – type of workplace visualization;
2) Job break down – new employee training system;
3) Muda-Mura-Muri – for improved manufacturing cycle and work;
4) Video analysis;
5) FAQ – to help train new employees.

This system will help not only landscape workplaces and factories, but also improve the manufacturing and working cycle and train new employees easier.

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MEADOWS GOLF COURSES IN THE LATVIAN COUNTRY LANDSCAPE

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Golf is unique. No other game is so dependent on the elements of the landscape to be its playing field. Golf utilizes the landscape and for that reason maintains a unique relationship with the environment. Understanding and addressing this relationship is essential to the design, construction and management of golf courses. Because of this, environmental issues have long since been a priority within the golf industry [2]. Latvia is relatively new to golf – we have only three standart golf courses, but we have also approximately ten meadows golf courses today. The research project has been carried out in Latvia from the autumn of 2009.

The aim of the research is to rebuild in higher plane unit and solidarity between man and nature through meadows golf. Meadows golf courses are more suitable for Latvian natural country landscape than standard golf courses. The worth of Latvian landscape, like in other European countries, is biodiversity and one of the environmental policy goals is to protect the current level of biodiversity [3] and landscape characteristics. To facilitate conservation of traditional landscape and to ensure sustainable use of natural resources – two particular targets of the biodiversity conservation sector [1].

The research results showed that country meadow golf facilities are not standart golf courses – the lenght of the holes and quality of the fairways and greens differ from usual standarts, but they are playable, and most are improving each year. Meadows golf courses support to diversification of non-agricultural activities and rural tourism are the basic services required by the population.

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VISUAL COMPARISON OF BIOCHEMICAL NETWORKS WITH MODERATOR

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ModeRator is a software tool for comparison of biochemical networks. In the context of the proposed software tool, biochemical networks, reconstructions and stoichiometric models can be referred simply as models. Originally the tool has been developed to compare genome-scale reconstructions stored as COBRA models, but it also works with SBML models. Its main purpose is to compare two complex models, but it also can detect the inconsistencies in a single model.
The molecular processes in cells form a huge network, which makes detailed mathematical modelling and simulation extremely difficult (Schulz, Uhlendorf, Klipp, & Liebermeister, 2006). Using the combined power of software packages NetworkX and Graphviz, ModeRator can generate a metabolism graph in two ways: “reactions as edges” and “reactions as nodes”. The “reactions as edges” method generates graph edges between all appropriate products and substrates. Only metabolites are graph nodes. The other method, “reactions as nodes”, generates edges from reaction substrates to the reaction node and edges to products.
Visualization is done by drawing a graph of one model and highlighting reactions that were found in the other model. The ModeRator analysis has been applied on two independent genome-scale reconstructions of *Zymomonas Mobilis*, by Lee (K. Y. Lee, Park, Kim, Yun, & Lee, 2010) and Widiastuti (Widiastuti et al., 2011). While the generated graph is not eye-caching even in high resolution, it is useful, because the user can quickly identify isolated reactions or groups of them. Blue ellipses and circles are metabolites, green octagons are reactions. Visualization reveals three isolated and common reactions.

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DEFINITION OF ENVIRONMENTAL RISK OF MACHINES AND MACHINERY IN TECHNICAL DOCUMENTATION

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The manufacturers are getting in increasingly complicated situation in assessing their environmental risks and defining environmental safety in the technical documentation with the new legislative requirements and tightening of the existing requirements in the field of machine safety and machinery which are intended in the form of directives, regulations, laws, technical standards. The own environmental risk of machines and machinery results from certain requirements of their design, technology of production and the assembly of their individual parts, components, functional groups and mechanical units from the requirements of their packing, transportation, commissioning, exploitation, operation, technical assistance, repairs, eventual reconstruction and liquidation after decommissioning. Further the energy requirements on their propulsion, the character of the used operating matter and other necessary materials, the character of wastes and emissions are also related to the certain requirements. The environmental risk of machine and machinery analysis is necessary to be carried out in terms of the hazard of the machines and machinery accidents and the hazard of breaking of the emission limits (material and energy emissions) at the standard and non-standard operating conditions of the machines and machinery. The obligation of the environmental risk of machines and machinery by the manufacturer from the phase of designing until the handover of the product to the user can be directly deduced from the European norms EN 1050:1996, as amended by ISO 12100:2010 "Safety of machinery – General principles for design – Risk assessment and risk reduction". The modified method of 10-BM-1050 for operational use by defining the immediate level of risk substantively based on the norm EN 1050:1996 can be applied for its own environmental risk of an accident of machines and machinery assessment. The proposed method is in conformity with the requirements of the relevant legislation and the normative regulations in the field of securing the safety of the machines and machinery. A modification of this method consists in execution of classification of environmental damage. The result of the solution is a draft of the transformation method 10-BM-1050 to assessment of the environmental risk of an accident of machines and machinery and definition of the individual classification degrees of damage on the environment. The analysis of the risk is subsequently possible to be applied for the purpose of fulfilling the criteria of the "Best Available Techniques" (BAT) in relevant machines and machinery.

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TRANSFORMERS AND THEIR EFFICIENCY

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A transformer is a device that transfers electrical energy from one circuit to another through inductively coupled conductors—the transformer coils. A varying current in the first or primary winding creates a varying magnetic flux in the transformer core and thus a varying magnetic field through the secondary winding.

The operation of a transformer is based on two principles: first, that electric current can produce a magnetic field (electromagnetism), and second, that a changing magnetic field within a coil of wire induces a voltage across the ends of the coil (electromagnetic induction). Changing the current in the primary coil changes the magnetic flux that is developed. The changing magnetic flux induces a voltage in the secondary coil.

Current passing through the primary coil creates a magnetic field. The primary and secondary coils are wrapped around a core of a very high magnetic permeability, such as iron, so that most of the magnetic flux passes through both, the primary and secondary coils. If a load is connected to the secondary winding, the load current and voltage will be in the directions indicated, given the primary current and voltage in the directions indicated (each will be alternating current in practice).

An ideal transformer would have no energy losses, and would be 100% efficient. In practical transformer energy is dissipated in the windings, core, and surrounding structures. Larger transformers are generally more efficient, and those rated for electricity distribution usually perform better than 98%.

Experimental transformers using superconducting windings achieve efficiencies of 99.85%. The increase in efficiency can save considerable energy, and hence money, in a large heavily loaded transformer; the trade-off is in the additional initial and running cost of the superconducting design.

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WHEN OLD MEETS NEW

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Meeting a renovation project, regardless of the scale of the efforts required, is often a sensitive and difficult process that needs careful planning. Customer relations, project management and thorough understanding of building materials and construction methods are essential in the handling of this very broad area of joinery.

Being able to understand a building and weigh out its qualities as well as constraints is a property that is of great importance and should be the first stage of the process, before any physical work is carried out. Knowledge of building techniques of the past that we come across on an everyday basis allows us to improve or compliment them accordingly without lessening the existing qualities. Renovation often means improvement of that which exists, be its energy efficiency, structural or aesthetic, and finding a balance between resources and results can be a complex process.

Knowledge of the law when it comes to altering a building, building an extension or affecting accessibility, as well as handling dangerous materials and safety issues is also unavoidable to achieve competent and serious results.

Naturally, when joiners specializing in renovation meet a project, we see some issues directly, and whilst in the physical working process, continue to come across moments where we are forced to rethink, re-plan and reprioritise our efforts. New damage can be found during the process and it requires communication with the client to plan the next step and this can be the case from the beginning to the end of a project.

Therefore, client to worker relations is a vital part of our projects. With open and realistic continual communication, trust and comfort can be achieved for both parties. Respecting the clients' needs and adapting to their terms is necessary as it is our ability to influence decisions regarding the quality and alternative solutions. Economical restraints can be the cause of an effort resulting in 70% improvement rather than near 100% for much greater resources, and where these limits lie can only be set by talking with the client and detailing the options available.

A model of the working process taking all this into consideration needs to be formulated which can easily be communicated to all parts involved before starting the project.

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Based on practical experiments and experience.

METHODS OF ESTABLISHMENT OF AGRICULTURAL CROPS IN TERMS OF WATER EROSION

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The paper focuses on evaluation of methods of establishing the maize crop and oat crop in terms of resistance to water erosion. For measurement of the field trial on land an average slope of 5.4 ° was established. The land is located in the area Nesperká Lhota at an altitude of 420 m. The soil is light on plot. The field trial consists of seven variants (4 variants with maize crop, 2 with oat crop, 1 without vegetation). Evaluation of variants with different tillage and land cover as well as plants or plant residues on the surface and surface soil layer was performed. The plot of land for one variant is 6m x 50 m, in the length side it is facing the fall line. For each variant experiment after sowing 4 micro plots for runoff were installed. The area is defined by walls of sheet metal. The collector is located at the bottom of each micro plot. It transports water into the plastic container, which is buried below the catching micro plots. The area of each micro plot is 0.16 m^2. Measurement of surface runoff followed ever after intense rainfall. The surface runoff was detected by measuring the volume, the amount of soil washed by filtering runoff and subsequent soil drying at 105°C and weighing the soil on a laboratory scale.

For the conventional tillage and sowing maize tillage statistically significantly higher soil loss by water erosion in the erosion events was found than for other variants based crop, corn and spring cereals. The results confirm the importance of soil conservation technologies of soil cultivation and sowing of maize to reduce the risk of land degradation by water erosion. The positive impact cover crop soil cover in the space between maize rows was also confirmed.

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СОВМЕСТИМОСТЬ КАК ВАЖНЫЙ ФАКТОР В РЕШЕНИИ ВИТАМИННО-МИНЕРАЛЬНОЙ НЕДОСТАТОЧНОСТИ У СЕЛЬСКОХОЗЯЙСТВЕННЫХ ЖИВОТНЫХ

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В настоящее время витаминно-минеральные, комплексные препараты интенсивно используются специалистами многих стран мира. Большинство публикаций на эту тематику не раскрывают всю сложность проблемы, с которой сталкиваются специалисты, а освещают лишь ее отдельные аспекты, остальное же остается за «кулисами» синтеза данного препарата. Но все чаще встает вопрос о совместимости уже известных микроэлементов и витаминов. Созданный на базе Института физико-органической химии НАН Беларуси и Института экспериментальной ветеринарии им. С.Н. Вышелесского инъекционный, многокомпонентный, хелатный, минерально-витаминный препарат с рабочим названием «Антимиопатик» создан с лечебно-профилактической целью при минеральной и витаминной недостаточности у сельскохозяйственных животных. Компоненты препарата находятся в хелатированном состоянии, а витамины в частности в виде наночастиц. Имеющийся в данный момент информационный задел, казалось бы, дал возможность избежать негативных, а именно с точки химии, антагонистических или синергичных связей среди компонентов препарата, нами получены результаты ранее не встречаемые в литературе. Создание и хранение препарата проводили в соответствии с документами, регламентирующими всю полноту данных этапов (Фармакопея Республики Беларусь, 2006), а также требований технических условий. В первоначальных экспериментальных образцах среди ряда элементов в препарате присутствовали селен и тиамин (витамин B_1), которые как оказалось по отношению друг к другу «выказывают» сильный антагонизм, что в последствии характеризовалось выпадением хлопьев черного цвета, размером 0,1 мм и менее, через 4-5 месяцев хранения при температуре +5 – +25°С. Факт установили при проведении тщательного анализа разных сочетаний компонентов препарата.

На основании этого был сделан вывод, что при создании многокомпонентных витаминно-минеральных препаратов следует, прежде всего, стремится к грамотному и научно-обоснованному подбору компонентов препарата и рациональному его использованию.

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НЕОБХОДИМОСТЬ ИЛИ ВЫНУЖДЕННАЯ МЕРА?

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В хозяйствах Республики Беларусь широко распространены болезни минеральной недостаточности, такие как остеодистрофия, железодефицитная анемия, беломышечная болезнь и др. Причем, часто наблюдается сочетанный дефицит микроэлементов, так называемые полигипомикроэлементозы. Они в значительной мере превалируют в структуре болезней обмена веществ и являются основополагающим фактором в снижении сохранности молодняка сельхозживотных, отставании их в росте и развитии, неспособности реализации генетического потенциала и предрасположенности к заболеваниям. При этом гибель животных может достигать 60-70%. Это связано с тем, что многие эссенциальные микроэлементы катализируют и ингибируют основные химические реакции обмена веществ, непосредственно или опосредованно участвуя в регуляции обмена белков, углеводов, жиров, энзимов, витаминов и гормонов. Дефицит микро- и макроэлементов является лимитирующим фактором продуктивности и производительной способности, а так же снижает качество животноводческой продукции. Беларусь сформировалась как биогеохимическая провинция с дефицитом в почве таких микроэлементов, как J, Se, Zn, Mn, Co, Cu, Mo и др., что является основополагающим фактором в развитии болезней минеральной недостаточности, а имеющий факт широкого распространения гипо- и авитаминозного фоно усугубляет протекания основного заболевания. Возникает острая необходимость создания препаратов на основе дефицитных химических элементов с лечебно-профилактической целью самого широкого спектра патологий животных. Для преодоления микроэлементной и витаминной недостаточности сельскохозяйственных животных необходимо наличие специальных комплексных препаратов. На базе Института физико-органической химии НАН Беларуси и Института экспериментальной ветеринарии им. С.Н. Вышелесского был сконструирован и успешно апробирован, инъекционный, многокомпонентный, хелатный, минерально-витаминный препарат с рабочим названием «Антимиопатик». Особенностью этого препарата в том, что витамины находятся в нем виде наночастиц, а микроэлементы в хелатном комплексе с поликарбоксилированными производными этилендиамина, которые осуществляют связывание ионов металлов через реакции карбоксильных и неподелённые электронные пары атомов азота.

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ИСПОЛЬЗОВАНИЕ СТАРИННЫХ ПАРКОВ ДЛЯ ОРГАНИЗАЦИИ ТУРИСТСКО-КРАЕВЕДЧЕСКОЙ РАБОТЫ С МЛАДШИМИ ШКОЛЬНИКАМИ

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Целью исследования является определение возможностей организации туристско-краеведческой работы (ТКР) с младшими школьниками. Специфика возраста таких школьников накладывает особые требования к такой работе. Это связано прежде всего с недостаточной для прохождения протяженных маршрутов силой. Кроме того, внеаудиторная деятельность, в структуре которой находится ТКР, требует особой мотивации как школьников, так и учителей.

В рамках нашего исследования мы остановились на выборе территорий для организации ТКР школьников города Барановичи. Мы учитывали, что такая территория должна находится вблизи от школы, или обеспечивать неутомительный доступ школьных групп.

Нами в качестве территорий для проведения занятий с младшими школьниками школ города Барановичи предлагаются старинные парки Домашевичи и Крошин, находящиеся вблизи от города.

Экологическая тропа в парке Домашевичи проходит через основные элементы паркового комплекса и включает 7 опорных точек. Привлекательность и эстетическая выразительность заключается в большом растительном разнообразия профиля тропы и окружающих ландшафтов. Длина экотропы — 1,4 км. По назначению проектируемая тропа относится к типу учебно-познавательных и предназначена для проведения экскурсий.

Экологическая тропа в Крошине проходит через основные элементы паркового комплекса и включает 7 опорных точек. Привлекательность и эстетическая выразительность заключается в большом растительном разнообразия профиля тропы и окружающих ландшафтов. Повышение внимания туристов может быть усилено через установку информационных аншлагов. Длина экотропы — 0,8 км. По назначению проектируемая тропа относится к типу учебно-познавательных и предназначена для проведения экскурсий.

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ЭСТЕТИЧЕСКОЕ ВОСПИТАНИЕ МЛАДШЕГО ШКОЛЬНИКА ВО ВНЕУРОЧНОЕ ВРЕМЯ

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С целью всестороннего формирования личности вводится система эстетического воспитания как организованная программа специальных техник индивидуального самостановления в сфере прекрасного. В работах известных ученых указывается особенная значимость этого явления и необходимость учёта возрастных и индивидуальных особенностей в связи с онтогенезом психики, носителя указанных техник. По мнению Б. М. Неменского, система эстетического воспитания должна быть, прежде всего единой, объединяющей все предметы, все внеклассные занятия, всю общественную жизнь младшего школьника, где каждый предмет, каждый вид занятия имеет свою чёткую цель относительно формирования эстетической культуры и личности младшего школьника. Системообразующую функцию в процессе эстетического воспитания в сфере духовной жизни, повседневной работы, общения выполняет искусство. Целью же эстетического воспитания выступает всестороннее целенаправленное формирование способностей воспринимать, переживать, понимать, ценить и создавать прекрасное с учётом принципа творческой самодеятельности учеников. В рамках эстетического воспитания осуществляется художественное воспитание.

Возможности учебного процесса в эстетическом воспитании могут быть значительно усилены проведением разнообразной внеклассной работы. Внеучебная (внеклассная) деятельность способствует более разностороннему раскрытию индивидуальных способностей ребёнка, которые не всегда удаётся выявить на уроке. В разных формах внеклассной работы (индивидуальные, групповые, объединяющие и массовые) дети не только проявляют свои индивидуальные особенности, но и учатся жить в коллектив, то есть сотрудничать друг с другом, заботиться о своих товарищах, ставить себя на место другого человека.

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FOOD PACKAGING: PLASTIC OR GLASS

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New regulations concerning food packaging safety will be introduced in Russia in 2012. Glass packaging for children food and alcohol products will not be put into circulation; it will be used only once. The leaders in the production of glass packaging claim, that this situation will lead to higher prices, broader use of plastic packaging in food industry, since there are few factories of glass recycling in Russia. At the same time, the attempts of ecologists to prohibit the usage of plastic containers for food products have not found the support of the government.

The restriction of glass packaging circulation in special kinds of food products and the lack of the government support in the limitation of plastic packaging will lead according to the authors' opinion to the increase of plastic packaging in food production. The research was made to compare the advantage of plastics and glass for food packaging. The research is based on: a) comparison of food quality preserved in glass and plastic containers; b) observation of environmental conditions in case plastic packaging will be used more often; c) data analysis of human health conditions resulting from the interaction of food and plastic packaging. The research showed that glass packaging is much more preferable than the plastic one. This affirmation is based on the following: a) the food in glass containers is kept longer and is tastier than if it is kept in plastics; b) toxic components of plastic packaging can get into human bodies as the result of the interaction with food. The scientific research held in the USA showed that 90% of harmful chemical elements found in human bodies are the result of plastic food packaging. According to the research a few milligrams of vinyl chloride in a bottle of carbonated water lead to the threat of cancer; c) sorting out the garbage at the present state of Russian development is possible only at industrial enterprises. In fact, plastic bottles and containers are not collected by the population. They are mainly buried but not recycled, which leads to the pollution of the environment. The research showed that glass packaging in food production is the only possible way of the food industry development. The necessity of glass recycling factories is evident for Russia. Glass recycling allows avoiding the waste of raw materials. It also reduces the consumption of energy and lessens the environmental pollution.

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ВЛИЯНИЕ ИНКРУСТАЦИИ СЕМЯН ЗАЩИТНО-СТИМУЛИРУЮЩИМИ СОСТАВАМИ НА УРОЖАЙНОСТЬ ЯРОВОГО РАПСА

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В последнее время в связи с глобальным загрязнением окружающей среды ужесточаются требования по снижению объемов применения средств защиты. Использование композиций на основе пестицидов, БАВ и микроудобрений позволяет снизить дозы химических препаратов без существенной потери биологической и хозяйственной эффективности, снять стрессорное влияние на растения пестицидов и неблагоприятных погодных условий. В условиях полевых опытов 2011 г. с яровым рапсом сорта «Гермес» (ОСП ЛГАК УО БарГУ) испытывались разработанные в Институте экспериментальной ботаники им. В.Ф.Купревича НАН Беларуси защитно-стимулирующие составы, включающие аналоги фунгицидов-протрави-телей с торговыми марками ТМТД (тирам (100 и 75% от рекомендованной дозы), Раксил Т (тирам + тебуконазол (100 и 75% от рекомендованных доз)), инсектицид имидаклоприд, производные фенилмочевины – тиоморе-вину, дифенилтиомочевину или смесь брассиностероидов (БС) – эпи- и гомобрассинолида. Закладка опыта проводилась по общепринятым методикам (Доспехов, 1985). Агротехника выращивания общепринятая в зоне. Развитие растений определялось по десятичному коду роста и развития растений (*BBCH*). В течение вегетации посевов рапса проводились фенологические наблю-дения, учет высоты растений и основных элементов структуры урожай-ности: количество стручков на растении, количество семян в стручке, мас-са 1000 семян, масса семян с одного растения и т.п. Результаты полевых опытов были подвергнуты однофакторному дисперсионному анализу при помощи стандартного программного обеспечения Microsoft Excel.

Выявлен наиболее эффективный защитно-стимулирующий состав – тирам (75%-ная доза) + имидаклоприд + ЭБ + ГБ (10 мг/т семян). При его использовании по сравнению с эталоном ТМТД увеличилась урожайность рапса на 14,2% (2,8 ц/га) за счет увеличения количества продуктивных побегов к уборке на 7,1% и массы 1000 зерен на 8,4%.

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ФОРМИРОВАНИЕ ЦЕННОСТНЫХ ОРИЕНТИРОВ СОВРЕМЕННОЙ МОЛОДЕЖИ

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На современном этапе развития образования, одной из наиболее важных проблем является проблема обеспечения молодежи возможности получить качественное образование. Но не менее серьезной и актуальной выступает проблема формирования ценностных ориентаций современной молодежи в условиях агрессивной внешней среды.

В Украине произошли кардинальные изменения в морально-нравственной сфере, произошла переоценка ценностей в условиях перехода к рыночной экономике. В этой связи актуализируются вопросы, связанные с формированием новых ценностных ориентаций молодежи.

В настоящий момент в Украине происходит смена образовательной парадигмы – от знанниевой к гуманистической личностно ориентированной, осуществляются коренные преобразования в социокультурной политике в целом, образование и воспитание ориентируются на развитие личности, раскрытие и развитие ее возможностей и личностных качеств.

Концепция модернизации украинского образования провозгласила первостепенным приоритетом педагогической деятельности – формирование у школьников и студентов гражданской позиции, духовности, культуры, способности к успешной социализации в обществе, а также ориентацию образования на развитие личности учащегося.

Социолог Семенов В. Е. на основе проведенных им исследований выделяет главные жизненные ценности современной молодежи. Результаты его социологических исследований показали, что главными жизненными ценностями молодежи являются семья, друзья и здоровье, затем следуют: интересная работа, деньги и справедливость (значение последней ценности в настоящее время все возрастает). Замыкает семерку главных жизненных ценностей религиозная вера [1. с. 37].

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CROSS-CULTURAL COMMUNICATION TEACHING

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Cross-cultural communication is an integral part of modern world as it influences the interaction between people of different nationalities and religions.
Cross-cultural communication consists of three components [2]:
• inter-cultural component analyses the details of similar phenomena in different cultures, for example, the difference between ritual greeting [2].
• socio-cultural component requires the analysis of social elements, for example, the study of ritual behavior with regard to the social status of the participant [2].
• cross-cultural component is based on a study of how the different cultural peculiarities influence the interaction of individuals [2].
In order to teach this aspect an English language textbook for Masters of Technology was published at St. Petersburg State Polytechnical University. This textbook contains a block of assignments to teach cross-cultural communication.
The inter-cultural component is implemented mainly during the first stage of the "multicultural" task and presents a set of summary information about different cultures and their characteristics.
The socio-cultural component draws on the information on non-verbal means of communication. It is realized through the discussion of cross-cultural situations with participation of different social status representatives or business partners. These cultural situations are provided with topical questions contributing to the discussions.
The cross-cultural component combines inter-cultural and socio-cultural parts and is implemented by finding the learners' solutions to the cross-cultural situations involved. It is recommended that this component be realized through problematic situation discussion and its causes. After that students may be asked to prepare a dialogue in pairs or small groups to solve the problem.
The use of culture-based exercises not only forms students' intercultural competence, but also contributes to communication skills development.

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PAISSIUS VELICHIKOVSKI.
A TEACHER WHO HAD NEVER HAD A TEACHER

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The paper is meant to be a portrait of the huge XVIIIth century personality, Paissius Velichikovski (1722-1794). Known in history as Saint Paissius Velichikovski or Saint Paissius Nemtskii, the Ukrainian monk and scholar represents a revolutionary turn in the history of the Orthodox Christian Church, a model of human self-perfection and a paradox for the world of scholars.

Born in Poltava in 1722, educated in Kiev, nourishing his spirit with sacred learning in the Romanian monasteries of Muntenia (part of the present Romania), the Saint pilgrim becomes a priest-monk and a starets (abbot) on the Sacred Mountain of Athos. There, he comes in contact with all the Byzantine greek writings, representing the patristic sacred learning of the Eastern Church. Coming back to the Romanian monasteries in Moldova and withdrawing there together with his whole community of monks (first to Dragomirna, then to Secu and finally, to Neamts monastery), he will organize an exceptional School for Translators having as its goal the translation of the patristic texts brought from M. Athos, from Greek, into both Slavonic and Romanian. Starets Paissius himself will translate the huge work of FILOKALIA in Slavonic. The School for Translators functioning within the walls of Neamts monastery, will send throughout the whole territory of the Eastern Church texts of tremendous value, becoming in this way a center for learning that will gather under the same roof monks-scholars of many different languages and nationalities (Russians, Romanians, Bulgarians, Serbians, Albanians, Greeks and even baptized Jews).

Running his School in Neamts as a starets, spiritual guide, translator and teacher, Paissius Velichikovski developed at the same time a theory of translation and an original pedagogical system. There he will prove to be a very talented teacher, although he never really had a teacher, having fled from the Kiev Academy as a schoolboy and never having found a master for his soul during his youth pilgrimage. Paissius Velichikovski had by far surpassed his own times. A great believer in God, a reformer and a renewer of the hesychastic tradition, an illuminated monk, a self-educated scholar who created a theory of translation and finally, an extremely gifted teacher whose message was meant for the whole world, throughout all ages of time and why not, even for the crisis the world is facing today.

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PASSIVE HOUSE

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A passive house is an energy-efficient building with good comfort levels and acceptable indoor environmental conditions without the use of active space heating or cooling systems. Space heating is conducted by passive means, e.g., heat from human body, electronic appliances or sun heat, so there is no need for conventional heaters. A passive house provides a very high level of thermal comfort and the temperature is even throughout the entire house. The concept of a passive house is based on minimizing the heat losses and maximizing the heat gains by any means necessary. Passive houses in warm areas usually are light and bright due to large glazed areas designed to optimize the solar gains, but passive houses in cold areas, such as Latvia, tend to be with smaller windows and thicker insulation.

The Passive house standard is a specific construction standard for buildings with good comfort conditions during winter and summer, without traditional space heating systems and without active cooling. The Passive house standard includes various positions used which determine the house comfort and heat loss levels.

The Passive house standard includes the building shell air tightness, it must be 0.6 air changes per hour at 50 Pascal pressure measured using the blower door test or less, the annual heat requirements must be 15 KWh/m^2 per year or less, primary energy consumption must be 120 KWh/m^2 per year or less, window U-value 0.8 W/m^2K, HVAC system with efficiency of 75% or higher with low electric consumption (0.45Wh/m^3) and thermal bridge free construction 0.01 W/mK or better. Compared to conventional residential houses, in Latvia passive houses use 12 to 15 times less energy. Although there are passive house systems with passive ventilation systems, but in colder places the passive ventilation system for passive houses is yet to be invented.

The passive house technology is becoming more and more popular due to the high energy costs and green thinking. Using less energy means generating less CO2 and to generate less CO2 is one of the main goals for environmentalists.

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TRENDS OF ECOLOGICAL CRISIS

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Efficiency of the modern agriculture substantially depends on usage of mineral and organic fertilizers.

In our country manufacture of mineral fertilizers in the XXI century began to extend considerably. The growth of the use of fertilizers and their role in increasing crops is proved also by the evidence and international experience. The need to apply fertilizers for increasing productivity causes contamination of soil and surface water, nutrients and fiber.

Agriculture is such a branch of economy, in which production is most closely connected to the nature; however, technical development and translation process of this sphere of human activity on an industrial basis have resulted in many adverse changes in the environment. The major factors of approaching ecological catastrophe are already well-known: pollution of air, ground and fresh waters, desertification, accumulation in the atmosphere of the gases which give a hotbed effect, acid rains, and violation of the ozone cloud protecting from space radiation.

The biosphere is enriched with various elements which influence the metabolism of both, plants and animals. Antibiotics and pesticides getting into animals will penetrate also into our organism, mainly with meat and vegetables. Mineral fertilizers poison our life, washed away by rains they flow down in the rivers, causing eutrofication - grassing of waters.

To solve environmental problems, we need an all-uniting idea, which could rally all layers of the society, political parties and public organizations of Russia, in the name of its revival and the world community - in the name of preservation of the life on the Earth.

Today all reasonable people realize that it is impossible to introduce substances and technologies that are dangerous to health, into the environment without taking into account all consequences because air, water and the ground make dialectic whole.

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КРУЖКОВАЯ РАБОТА КАК СРЕДСТВО РАЗВИТИЯ ПОЗНАВАТЕЛЬНОЙ АКТИВНОСТИ ШКОЛЬНИКА

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Сегодня достаточно эффективной формой индивидуальной работы, способствующей активизации познавательной деятельности школьников является кружковая работа.

Педагоги рассматривают кружок как эффективную форму внеклассной учебной работы по определенному предмету. Кружки служат действенным средством в решении таких задач как: закрепление, обогащение и углубление знаний, приобретенных в процессе обучения, применение их на практике; расширение общеобразовательного кругозора учащихся, формирование у них научного мировоззрения, формирование умений и навыков самообразования; формирование интересов к различным отраслям науки, техники, искусства, спорта, выявление и развитие индивидуальных творческих способностей и наклонностей, организация досуга школьников, культурного отдыха и разумных развлечений; умственное, нравственное, эстетическое, физическое и трудовое воспитание.

Познавательные интересы школьников нередко выходят за пределы учебных программ и учебников. В этом случае умело организованная кружковая работа приобретает большую педагогическую значимость. Педагоги должны тщательно продумывать содержание занятий, используя новые, еще не известные ученикам факты, формы и методы, которые усиливали бы их познавательный интерес.

Предметным кружкам сравнительно с другими формами внеклассной учебной работы присущи такие особенности: общность познавательных интересов учащихся, их положительное отношение к изучению данного предмета, любознательность и т.д. [1].

Наиболее результативной кружковая работа может стать для учащихся 5-8 классов, так как они уже в определенной мере владеют необходимыми навыками коллективной работы. У этих учащихся уже более четко определились интересы и склонности. Однако отдельные кружки могут быть организованы и для учащихся 3-4 классов. Для более старших учащихся организуются кружки на основе тех профессионально-трудовых навыков и знаний, которые они уже приобрели.

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ПРИЧИНЫ ПЕДАГОГИЧЕСКОГО КОНФЛИКТА И ЕГО ОСОБЕННОСТИ

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Взаимодействие учителя с учениками организуется через разрешение педагогических ситуаций. Педагогические ситуации могут быть простыми и сложными. Простые разрешаются учителем без встречного сопротивления учеников через организацию их поведения в школе. В сложных ситуациях большое значение имеют эмоциональное состояние учителя и ученика, характер сложившихся отношений с соучастником ситуации. В том случае, когда не удается вовремя разрешить проблему, возникает конфликт.

Среди потенциально конфликтогенных педагогических ситуаций можно выделить следующие:

1) ситуации (или конфликты) деятельности, возникающие по поводу выполнения учеником учебных заданий, успеваемости, внеучебной деятельности; 2) ситуации (конфликты) поведения (поступков), возникающие по поводу нарушения учеником правил поведения в школе, чаще на уроках, и вне школы; 3) ситуации (конфликты) отношений, возникающие в сфере эмоционально-личностных отношений учащихся и учителей, в сфере их общения в процессе педагогической деятельности

Подводя итог, можно сказать, что взаимодействие учителя с учеником происходит через разрешение педагогических ситуаций, которое поможет избежать в дальнейшем возникновения конфликта. Причинами данного конфликта могут быть ситуации, возникающие по поводу выполнения учеником учебных заданий, успеваемости, внеучебной деятельности, по поводу нарушения учеником правил поведения в школе и вне ее, ситуации, возникающие в сфере эмоционально-личностных отношений учащихся и учителей. Учителю необходимо анализировать поступки ученика в индивидуальном порядке, так как один и тот же поступок может быть продиктован совершенно разными мотивами. Причиной конфликта так же может служить неправильная оценка поведения и неумелое разрешение педагогом ситуации. Подобные конфликты часто приобретают личностный характер.

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“DYNAMIC” SHAFT DRIVE BICYCLES

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Shaft drive bikes actually date back to the early 1900's, when riders such as Major Taylor won historic races on a shaft drive bicycle. However, at that time, although shaft drive bikes were popular due to their clean, safe operation and smooth ride, they were only single speed bikes. With the introduction of chain and derailleur systems, shaft drives fell out of favor in exchange for the versatility that gearing provided.

In 1991 considerable changes happened. This is when the factory - Sussex Enterprises Co. Ltd, based in Taichung, Taiwan - introduced the modern shaft drive transmission system. Sussex is considered the pioneer of the modern shaft drive. It was the first to introduce spiral bevel gears into the shaft drive system, which made the gearing smoother and stronger. Sussex was also the first to develop the interface to Shimano's advanced 7-speed and 8-speed internal gear hubs, giving its bikes incredible versatility and performance. We are currently on our third generation shaft drive.

It was Shimano's development of the internal hubs that became the catalyst for the renaissance of the shaft drive system more so than the engineering advances of the shaft drive itself. Without these hubs, the shaft drive is a single speed transmission. By combining the shaft drive with the internal hub our bikes deliver the best of both - clean, low maintenance operation, as well as the versatility of a wide range of gearing.

It is worth considering the advantages of using bicycles in today’s conditions when we are thinking about saving energy and the surrounding environment.

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VITAMIN C AS NATURAL ANTIOXIDANT OF HORSERADISH

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Horseradish (*Armoraciarusticana*L. Family: *Brassicaceae*) is a perennial plant, which is distributed in the central and northern Europe and contains biologically active compounds with antioxidant properties. Vitamins are an important group of natural antioxidants - various organic compounds, which are necessary for normal functions of living organisms and in very small amounts promote normal metabolism of the body. Plants synthesize vitamins, but men take them mostly with food [1].

The aim of the experiment was to compare the content of vitamin C and DPPH antiradical activity in different genotypes of horseradish roots.

The experiments were carried out at the Faculty of Food Technology, Latvia University of Agriculture. The samples were collected in the Pure Horticultural Research center in November, 2011. The content of vitamin C was determined using the iodometric titration method and the antioxidant activity of the plant ethanolic extracts was measured on the basis of scavenging activities of the stable 2,2-diphenyl-1-picrylhydraziyl (DPPH$^{\bullet}$) radical. The roots were analyzed after 30 days of storage +4±1 °C using the iodometric method. For statistical analysis the Tukey test and Linear Correlation analysis were used. The differences were considered significant at $p<0.05$.Vitamins are very labile compounds and various environmental factors affect losses of their biological activity and also, the presence of metal ions promote the degradation of vitamins. The results of the Tukey test showed that the vitamin C content in horseradish roots belonging to various genotypes differed significantly ($p <0.05$) and ranged from 33.32 to 92.63 mg 100 g^{-1} of fresh product. The studied horseradish root antiradical DPPH activity ranged from 19.2% to17.51%. To explore the influence of the phytochemical constituents on the antioxidant activity in horseradish roots, the correlation between DPPH antioxidant activity and vitamin C was determined. The antioxidant activity of horseradish roots appears to be weakly influenced by the vitamin C level. Weak and very weak linear correlation was observed between the antioxidant activity of the investigated horseradish root samples and their content of vitamin C.

Since there are a large number of different types of antioxidant compounds that might contribute to the total antioxidant activity, it is not clear which components are responsible for the observed antioxidant activity. This supports the observation that vitamin C may not be one of the major antioxidants in horseradish roots.

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LIGHTNING OR EXTERNAL OVERVOLTAGE FOR POWER LINES

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The Globe with the surrounding atmosphere consists of a gigantic spherical condenser, where one electrode is the Earth and the other consists of the ionosphere. Land is always charged negatively, but the ionosphere is positive. Between the Earth and the ionosphere there are 280-350 kV, and because of solar activity this capacitor is always charged and thus creates lightning.

Lightning is an atmospheric electrostatic discharge (spark) accompanied by thunder, which typically occurs during thunderstorms, and sometimes during volcanic eruptions or dust storms. From this discharge of atmospheric electricity, a leader of a bolt of lightning can travel at the speed of 1000-2000 km/s. There are some 16 million lightning storms in the world every year and 1800 lightings every moment. Lightning can also occur within the ash clouds from volcanic eruptions, or can be caused by violent forest fires which generate sufficient dust to create a static charge. Scientists have studied that lightning is caused by atmospheric perturbations (wind, humidity, friction, and atmospheric pressure) to the impact of solar wind and accumulation of charged solar particles. Ice inside a cloud is thought to be a key element in lightning development, and may cause a forcible separation of positive and negative charges within the cloud, thus assisting in the formation of lightning. 80-90% of all lightning discharges occur from the cloud, whose lower layer is charged negatively. External overvoltage is voltage in electric power lines which is caused by direct lightning impact or its inductive apparition. Direct lightning disruptive discharge in electric lines can initiate current in houses nearby and cause danger to their electric installation and indoor electric appliances as well as endanger people inside. To avoid the lightning threat posed by power lines and transformers several protective devices like lightning-rods, dischargers and surge arresters are applied. A surge arrester is a device used on electrical power systems to protect the insulation and power lines in the system from the damaging effect of lightning. In Latvia different types of lightning protection are used for different types of distribution systems - for 20 kV lines “POLIM” 22(24) kV surge arresters are used, which are made in Switzerland and for 0.4 kV lines surge arresters “LOVOS” are used, which are made by the same company ABB. But for the transformers both surge arresters are used: “LOVOS” for 0.4 kV side and “POLIM” for 20 kV side, because transformers connect both types of electric line.

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EXHAUST GAS RECIRCULATION VALVES

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Studying at the Faculty of Engineering the students acquire the constructions of different kinds of engines. The present article discusses exhaust gas circulation valves and their qualities.

Internal combustion engine exhaust gas recirculation (EGR) is a nitrogen oxide (NOx) emissions reduction technique that is used in most gasoline and diesel engines. EGR activity is a fundamental principle to lay down exhaust gases discharge back to the engine cylinders.

As the NOx contributes to the occurrence of high temperatures, EGR reduces the NOx generated emissions. NOx is mainly resulting from the exposure of nitrogen and oxygen mixtures in high temperatures.

In the standard spark-ignition engine 5 to 15 percent of the exhaust gases is returned to the fuel supply to EGR. This amount is adjusted based on the need to determine the total flame front during combustion; excessive EGR in spark-ignition engines can cause combustion problems. While the EGR gas slows down the fuel fire, it can be largely offset by accelerating the response time of ignition. The EGR efficiency is largely dependent on the particular type of engine, and sometimes it provides a compromise between the efficiency and NOx emissions. Proper operation of EGR can theoretically improve the operation of gasoline engines with the following results: reduced throttling losses, reduced heat discharge, reduced chemical release, and reduced specific heat.

In the new diesel engine models EGR gas is cooled, the heat exchangers increase the amount of gas used to recycle. Unlike spark ignition engines, diesel engines can operate without prejudice to the overall rate of the flame front. In addition, the diesel engine always operates with redundant air supply, so the EGR rates can reach up to 50% (idle, if a large quantity of excess air) NOx emissions through regulation.

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ЗЕМЛЯ ПРИНАДЛЕЖАЩАЯ ГОСУДАРСТВУ И САМОУПРАВЛЕНИЮ В ЯУНГУЛБЕНСКОЙ ВОЛОСТИ

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Права государства и самоуправлений на землю можно подразделить на две группы – собственность государства или самоуправлений и подведомственная им земля [1].

В ходе земельной реформы права государства и самоуправлений на землю главным образом определялась не только по её принадлежности на 21 июля 1940 года, но и в следущих случаях:

- законодательством не предусматривалось восстановление прав на землю бывшим собственникам;
- бывшие собственники не требовали восстановить права собственности, уже получили равноценную землю в другом месте или компенсацию за землю (сертификаты).

В сельской местности государству и самоуправлению были гарантированы эксклюзивные права на застроенную и не застроенную землю. Исследование, проведенное в Яунгулбенской волости, показало, что в Кадастровой информационной системе на июль 2011 года были зарегистрированы: 32 земельных участка, принадлежащие и подведомственные государству общей площадью 612,44 га, из которой 15% составляет застроенная земля и 85% – незастроенная земля; 160 земельних участков, принадлежащих и подведомственных самоуправлению общей площадью 611,03 га, из которой 19% составляет застроенная земля и 81% – незастроенная земля [3].

Исследование показало, чтов Яунгулбенской волости эта земля в Земельную книгу записана в лице министерств Транспорта, Образования и науки, Сельского хозяйства и Экономики, а также в лице Национальной лесной службы [1].

Анализ архивных документов также показал, что в Яунгулбенской волости эта земля главным образом используется для поддержания хозяйственной деятельности, сохранения особо ценных пейзажей и зеленой зоны, а также для устройства дорог и улиц общего пользования.

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FARO ARM AS MEASURE OF SUCCESS

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More and more manufacturers are forced to test their products using stationary, cost intensive measuring installations. It has been the situation until now. The idea of creating a portable measuring device that is as easy to operate as it would be if you just needed to point your finger to something to get precise results straight away, has made FARO a leading manufacturer of portable 3D measuring devices. The Faro arm is a coordinate measuring machine that utilizes a multi joined probe for versatile measurements. Paired with Spatial Analyzer, which is used to interface with the measurement as well as manage the measured coordinates, the FARO Arm is a powerful tool in determining spatial relationships. The FARO arm includes: simple linear measurements, GD&T, coordinate based measurements, alignments to CAD files, calibrations, documentation (reporting), reverse engineering with accuracy up to 0.02mm in 3 m range.

The CMM platform has a universal 3.5” mounting ring for easy adaptability and compatibility with flexible mounting options, like vacuum, magnetic mounts, instrument stands and tripods, that afford the “measure where you make it” capability. Together with powerful CAM2 Measure software, parts can be compared directly to the CAD data. Geometric comparisons of the finished part can be made in real-time in the production floor. The FARO Arm is great help in serial production where a lot of different dimensions are essential to the customer. With a correctly made measuring procedure it is possible to test the produced part up to 80 % faster and more precise.

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RENEWABLE ENERGY: SOLAR POWER

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Nowadays we cannot imagine our everyday life without electricity, but the problem is that not all of the ways to generate power are friendly to environment. In the opinion of the author the solar energy is the most practical source of energy.

Solar energy at its most basics is radiation generated by the Sun that reaches the Earth as light and heat. So, instead of spending enormous amounts of money, and most importantly non renewable resources, why not use the most powerful existing energy source – the Sun.

Solar energy can be harnessed in different levels around the world. Depending on the geographical location, the closer to the equator the more energy is available.

It means that it is not the option in some regions near the poles, but even if it will be used only in regions with a hot, sunny climate it will make a huge difference.

Every minute enough energy arrives to the Earth which can meet all our power needs many times over, if only people could handle it properly.

Here are some applications of solar energy: solar cells which convert light into electricity, solar water heating systems, solar boilers. Furthermore, solar cells provide energy to run satellites that orbit the Earth which gives us satellite television, telephones, navigation, weather forecasting, the Internet and all manners of facilities people cannot imagine life without.

Last but not least there are solar vehicles invented. There are solar batteries installed on the roofs. It will be a remarkable step to reduce the harmful exhaust fuels which is the main cause of global warming.

In conclusion, the author thinks that it is the most convenient energy source and it also can be used in Latvia next to wind, geothermal, hydro electrical and heat power to develop the economics of our country.

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BIOGAS PURIFYING AND UPGRADING TECHNOLOGIES

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Biogas is a gas mixture obtained from farming and agricultural raw materials, and it mainly consists of methane, carbon dioxide, hydrogen sulphide and other chemical elements. Application of biogas is wide – it can burn in cogenerators used for production of electricity and heat energy, but if biogas is purified and upgraded, it can be used for injection in gas grids or as a fuel for transport. To purify and upgrade biogas means to remove carbon dioxide and corrosiveness hydrogen sulphide. The goals of the research are to compare the main technologies, develop a project and construct equipment for usage on farms.

Purifying and upgrading of biogas means removal of CO_2, H_2S and other possible pollutants from biogas. In the world there are five main technologies used for biogas purifying and upgrading. Biogas waste pollutants (CO_2) are separated from biogas by the pressure swing adsorption method under pressure through molecular sieves. This technology can not purify biogas from hydrogen sulphide, which is corrosiveness, and H_2S needs to be separated before application of the technology. The second process to upgrade biogas is cryogenic separation. The principle of this technology is that biogas liquefies at different temperature and the pressure can separate biogas into components. Typically temperature of -90^{o}C and pressure of 40 bars is used. Chemical absorption is based on chemical reactions where the hydrogen sulphide and carbon dioxide chain catalysts into a chemical compound. The chemical compound with pollutants after separation from biomethane can regenerate into a compound with other chemical substances. CO_2 is removed and treated as waste. One of the technologies of purifying and upgrading biogas is high pressure water scrubbing. This technology is based on the physical fact that gases dissolve in liquids. Carbon dioxide and hydrogen sulphide in a scrubber dissolve into water, but not biomethane, because it is different, it does not dissolve.

The final technology to separate biogas is membrane separation. Methane (CH_4) and pollutants (CO_2 and H_2S) have different molecule sizes. While pollutants go through a certain membrane, methane does not.

To compare these technologies for our farm consumption, the most advantageous is the membrane separation. This technology is simple with low investment and running costs, and quite small plant sizes.

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ACCESS TO LAND PARCELS IN LOCAL MUNICIPALITY OF VIRCAVA

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Within the land reform legal, social and economic property and land use relationships in Latvia were rearranged. This process also foresaw to take into consideration a rational territory planning. While granting land for use or ownership, rights to pass through the property of another person to get to its own were granted based on several acts but there are many cases when Land Commissions or land requesters have not set these driveways. Lately the number of court cases has increased about easement establishment or disputes over its usage [3].

The purpose of the research is to analyse whether an access to every land parcel is provided by a municipal road or determined by an easement and the form of each easement establishment in Vircava. The data on access to every land parcel were obtained using the survey data carried out in 2010 by students in Vircava recording which land parcel could be reached by the road and which could not. The form of easement establishment was clarified using the cadastral data where land parcels and properties burdened with easements were sorted out; the files of encumbered properties were looked through in the archive of Zemgale regional Department of State Land Service.

The analysis showed that there were 77 land parcels with no municipality road to access them though the cadastral map and orthophoto analysis showed that most part of these parcels might be reached by the road. 24% (799 properties) are encumbered with easements. An easement may be established by law, contract or court decision [1, 2]. In 68% cases easements were established by law, in 13% cases the form of establishment was not determined due to lack of documents, and 19% of files were not available in the archive. The research leads to a conclusion that in most cases during the land reform easements were established when needed.

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RESEARCHE IN ELECTROMOTOR VEHICLE SERVICING

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Every year, more and more electric vehicles appear in the market, which requires specific maintenance different from that for the usual internal combustion engine.

Significant difference between electric vehicles and gasoline-powered vehicles is the number of moving parts. The electric vehicle has one moving part, the motor, whereas the gasoline-powered vehicle has hundreds of moving parts. Fewer moving parts in the electric vehicle lead to another important difference. The electric vehicle requires less periodic maintenance and is more reliable. The gasoline-powered vehicle requires a wide range of maintenance, from frequent oil changes, filter replacements, periodic tune ups, and exhaust system repairs, to the less frequent component replacement, such as the water pump, fuel pump, alternator, etc.

The electric vehicle maintenance requirements are fewer and therefore the maintenance costs are lower. The electric motor has one moving part, the shaft, which is very reliable and requires little or no maintenance. The controller and charger are electronic devices with no moving parts, and they also require little or no maintenance. State-of-the-art lead acid batteries used in the current electric vehicles are sealed and are maintenance free. However, the lives of these batteries are limited, and they will require periodic replacement.

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DIDACTIC ASPECTS OF SUMMARY TRANSLATION TEACHING FOR STUDENTS MAJORING IN TECHNOLOGY

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Summary translation is considered to be a didactic resource in foreign language teaching for students of technology. This integrative kind of translation activity involves the development of the learners' analytical skills, as well as linguistic abilities of textual compression drawing on the synthesis of professionally relevant information. Stages of teaching summary translation are discussed [1].

A summary is a short text that students write in order to provide their reader with the main idea of another piece of writing. Here are some important details to remember about summaries:

- summaries are written for people who have not read the original article;
- they are always much shorter than the original;
- they contain only the most important information from the original;
- they begin with the main idea of the original text (this is the first sentence of the summary);
- a student is not supposed to change any information available in the original text;
- summaries are written in the student's own words (none of the sentences used by the original author are allowed);
- they contain none of the students' opinions.

The basic skills in summarizing competence are: 1) finding and formulating the main idea; 2) paraphrasing; 3) writing an outline 4) writing transitions [2].

Summary translation attracts our attention as a potentially useful aspect of translation, integrating not only the translation activity itself, but also analytical skill training, which is useful to develop.

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NIKOLAY RUBTSOV – THE CHASE AND THE FURY

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The ineffable in Rubtsov's poetry lies not only in the calm and quiet rhythm of his verse, but also in the elegant fury underneath that gives birth to an entanglement of meaning and passion defined only through a "static movement". That is why we speak of a pause or a lapse in time and space, and also a tension that builds up around these pauses, a tension which gives the experience to the quality of a dream, about to invade reality: *"Over the hills – they look like giants -, / At times you happen to see riders, / And again – only the horizon in shrubs, / This corner of the world is but oblivion..."* (The Road of Past Times).

There is a chase, a continuous chase that pervades every line in a circular motion, advancing round and round towards a point across infinity. It is almost as if it was trying to submerge the immensity of space into one imaginary leap. The Russian steppe becomes an almost impossible existence; if it does reach that point across infinity, is it really earthly? And is it an extension of the being or a painful reminiscence of a more complete self? It is this rupture that haunts the poet, the distance between the self and the very essence of nature and all that it ensconces. He is deprived of its sacred embrace and remains thus forever alone in the middle of it; surrounded by everything he loves which he can never be a part of: *"Animals give birth and wheat is being ground, /Everything runs smoothly, blooming...Yet defend me, blizzard, / Oh, your howling keeps me safe!"* (The Moaning of a Drunkard).

There is awe and sorrow in the spectacle of nature, but there is a deep revolt in the knowledge that he will be swallowed up among those shadows and driven to his grave in the same oblivion in which man has cast the Russian lands: *"Shaken beyond himself, he flinched, / He staggered and fell into oblivion.../Without a shout, without words – he died: / He knew he would die in the middle of the road."* (**The Stranger**).

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STUCTURE OF IMPACT OF MAXIMAL TEMPERATRE ON RADIAL GROWTH OF SCOTS PINE (*PINUS SYLVESTRIS* L.)

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There are made different scenarios for climate changes in Europe - from unexpected hot summers and cold, snowy winters to mild winters with extreme precipitation, long drought periods in summers and storms [1, 2]. Whatever will happen in future the only solution for successful development of forestry is serious work in the field of tree adaptation as far as our knowledge and technological options allow us. One of the possibilities of forestry adaptation to the climate change is implementation of the shift direction of the tree growth active periods in the level of strategic planning. For reasoned explanation of the change of several meteorological factors and their effect on different ecosystems, including forest ecosystem, there is a need to use sufficiently long periods of time [3]. The quantitative indicators of tree growth are a valuable material for studies of tree response reactions due to the climate change. The study is based on the hypothesis that the effect of different environmental factors, including temperature, affecting tree growth is changing - the intensity as mode of action. It comes from the fact that the requirement of environmental factors for the biological system is not constant in time.

For describing the structure of the temperature impact on Scots pine growth and seeking for change and shift direction reporting the periods from 1960 - 1985 and from 1986 - 2009 are divided in decades. The empirical data - Scots pine annual ring width measurements come from the Tērvete Nature Park but the meteorological observation data of the meteo station Jelgava – from the State limited liability company "Latvian Environment, Geology and Meteorology Centre". The zones where the factor acts statistically significantly are indicated using the Pearson correlation coefficient r values which are greater than the critical $r_{\alpha;n}$ ($\alpha = 0.05$ and $\alpha = 0.01$).

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SOCIAL INNOVATION IN TERTIARY STUDIES

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Social innovation has become the dominant response to challenges in all the domains of modern life. One of the mechanisms of social innovation is peer-learning. This requires peer-learning to be integrated into the processes and environments of tertiary studies. The aim of the study is to analyze factors that influence peer-learning in student police officers' tertiary studies. The meaning of the key concepts of *social innovation* and *factors* is studied. Moreover, the study demonstrates how the key concepts are related to the idea of tertiary studies and shows a potential model for development, indicating how the steps of the process are related following a logical chain: defining social innovation → determining tertiary studies → revealing factors → empirical study within a multicultural environment. Qualitative evaluation research has been used. The present research was conducted during the implementation of English for Specific Purposes studies in the English as a foreign language course within the professional development program Police work of the State Police College in 2010-2011. The findings of the research allow drawing the conclusion that the external factors and, particularly, factors forming communication influence peer-learning in student police officers' tertiary studies. Directions of further research are proposed.

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СОСТОЯНИЕ ТУРИСТСКО-РЕКРЕАЦИОННОЙ ДЕЯТЕЛЬНОСТИ В ГАНЦЕВИЧСКОМ РАЙОНЕ БЕЛАРУСИ

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В нашем исследовании мы рассматриваем перспективы развития туристско-рекреационной деятельности в Ганцевичском районе Брестской области Беларуси. Развитие туризма в районе важно не только для расширения сфер занятости местного населения, но и для сохранения природных и историко-культурных объектов на территории района. Опыт других районов, которые схожи с Ганцевичским по туристическим ресурсам, доказывает, что развитие туризма в подобных районах целесообразно.

Главным богатством Ганцевщины является удивительная первозданная природа края. В районе 27 болот, занимающих площадь 11,9 тыс. га. Здесь протекают реки: Лань с притоком Нача, Бобрик, Цна с притоком Выдренка, которые принадлежат к бассейну реки Припяти, расположено 11 озер, 5 водохранилищ, в том числе водохранилище Локтыши, заказники «Выгонощанское», «Подвеликий мох», «Борский», «Еловский». Уже сейчас разработаны ряд турмаршрутов на территории района.

Давние традиции в Ганцевичском районе имеет охотничий и рыболовный туризм. Охотничий туризм организуется Ганцевичским отделением Белорусского общества охотников и рыболовов. На территории ОАО «Рыбхоз «Локтыши» организована платная рыбалка.

Таким образом, уже в настоящее время в Ганцевичском районе развиваются познавательный, научный туризм, экотуризм, агротуризм, рыболовный, охотничий туризм. Количество же субъектов туризма невелико. Общей проблематикой для развития туризма в Ганцевичском районе, по нашему мнению, является отсутствие организаций, предприятий, для которых туристская деятельность является основной и бюджетообразующей. Требуется дальнейшая работа по распространению информации об уже имеющихся маршрутах, в том числе на иностранных языках. Актуальным является создание специализированного туристского сайта, посвященного району. Необходимо продолжить презентацию туристских возможностей Ганцевичского района на специализированных выставках, привлечение внимания турфирм со всей Беларуси по организации турдеятельности в районе.

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STEM LODGING RESISTENCE DETERMINATION USING PLANT ANATOMICAL PARAMETERS

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The productivity of such cereals as wheat, barley and oats depends not only on agrological and meteorological conditions, but also on the length and anatomical structure of plants. Cereal stem lodging is a process by which the shoots of cereal plants change their upright position to vertical. It is a serious problem in both organic and conventional growth conditions, causing grate losses for farmers. In organic farming the usage of growth regulators is limited and the variety should show great resistance of lodging. Conventional farming enables the use of heightened nitrogen norms for achieving greater yields, but the plant becomes higher and less resistant to lodging. It is known that there must be a correlation between the plant anatomical parameters and lodging, but only the use of physical laws can prove it. Several theoretical models are developed including meteorological parameters, anatomical parameters, and stem mechanics for wheat, but there is no literature found about field trials of oats for detecting the lodging resistance. It is not possible to compare wheat parameters with oat because of different plant structure. The recent years showed meteorological conditions unsuitable for oat growing in Latvia. Wet summers established great conditions for lodging of all cereal crops. Differences can be seen not only among species, but also among varieties. Several oat varieties showed high resistance of lodging on field, but some were lodged down, because of their differences in the stem strength and durability. The studies of oat plant anatomical parameters and lodging resistance should and will be performed also in future.

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DIET OF STONE MARTEN, *MARTES FOINA*

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The stone marten's diet consists of various components. Recent studies have revealed that it consists mainly of rodents, birds and various forest fruits. The amount of individual components in the diet varies from site to site depending upon the relative abundance. The relation between the proportions of the dietary components and their respective relative abundance is expected. In the present work we present the relation between the percentage of the diet components and the site from which the samples were collected, with special attention paid to chiropterofauna.

Bats being components of the stone marten's diet, is rarely documented in literature. They are recorded especially seasonally or under propitious conditions. Some of the stone marten individuals are specialized in hibernating bats.

In the study we present a comparative analysis of excrement samples collected from two sites with a different chiropterofauna species structure. The "Nietoperek" reserve being the largest hibernating site for bats in the Central Europe and the "Mopkowy Tunel" being the largest hibernating area of *Barbastella barbastellus* in Poland were the choice of the sites for our study. To make the analysis the excrement samples were collected and then the proportion of the components in this excrement was investigated. It was divided in several categories like plant debris, animal remains, seeds and plastics.

After meticulous analysis of the data we have come to the conclusion that in presence of favorable conditions like abundance of certain kinds of food, in this case – bats, stone martens can become monodietic to a great extent.

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CONCEPT OF WOOD BRIQUETTES BOILER AUTOMATION

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Today Europe is thinking how to reduce the amount of imported natural gas from Russia [1]. In many European countries it is easy to implement the solar or wind energy, but those cases are not the best solution for Latvia geographical position. If the government wants to reduce the amount of imported natural gas from Russia, then the biomass burning systems are the target what to show for the citizens as an alternative for natural gas burning systems. To do that there is a need to make the solutions as close as possible to the natural gas burning system. The main target is to make the solution with the automated solid fuel boiler heating system.

To find the best and most appropriate solution the research was made in a standard private house with the area 135 m3 and a standard solid fuel boiler was used made in the central region of Latvia, Ozolnieki. The boiler is made for all types of solid fuel use. For mechanical drawings and simulations software SolidEdgeV21 was used and as temporary automation software Freelance V9.2 was chosen. The research period was made in the heating season of 2011/2012. Case studies to find solutions, make conclusions and implement the research results was a very important part.

The easiest type for automation of solid fuel is a pallet, but nowadays there are a lot of solutions in this area. The next technically easiest way is briquettes fed in boiler automation. The reason for that is the standardized shape and high energy accumulation in one kg of briquettes [2]. Today it is possible to buy two types of briquettes and the most flexible is the square brick type briquette. In the automation process the air outlet valve and air inlet valve automatic control is important.

The solution for automated solid fuel boilers is decided regarding the main information, but nowadays there are many types of boilers what means that there will be a need for individual redrawing of the mechanical part. The new boilers can be implemented with standard solutions. The average time when the boiler can hold the temperature inside the house at one load is from 12-24 hours depending on the ambient temperature. The size of the briquettes is most important what has to be 100mmx150mmx60mm (WxHxD) with tolerance ±5mm, the material of the briquettes can be set regarding the users' needs [3].

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PARTICULARITY OF STRESS-COPING ABILITIES ADVANCEMENT IN SENIOR STUDENTS OF EDUCATIONAL DEPARTMENTS

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The subject of the work is individual resistance to stress and stressors. Our main objectives were: to analyze the existing research findings concerning the resilience, social and emotional competence; to find out the peculiarities of individual resistance and its constituents as well as intercorrelation between the mentioned constructs; to prove our hypothesis that individual resistance is a multicomponent construct with main constituents.

The phenomenon of individual resistance is a complex construct consisted of resilience, social and emotional competences. Resilience means using your energy productively to move ahead in the face of adversity [1]. Social competence is the ability to understand and manage men and women, boys and girls, to act wisely in human relations. In other words it is the ability to be successful in social interaction. Emotional competence is the ability to perceive, apprise and express emotions accurately and adaptively, it is the ability to understand emotions and emotional knowledge, the ability to access and generate feelings and ability to regulate emotions in oneself and others [2]. Individually resistant children displayed additional traits, such as self-help skills and language development.

The research was conducted in 2010-2011 aiming at scrutinizing the correlation of individual resistance with its constituents. A battery of 3 questionnaires was spread among 124 people.

Some results of statistic analysis are represented in the article. The results will show the difference between the levels of resilience, emotional and social competences evolvement among students from various faculties. Moreover, a correlation matrix was created. The results display that there are a lot of correlations between constituents of individual resistance.

It is impossible to prevent all of the hazards that jeopardized the lives of people of all ages and in different spheres of activities. Therefore, we must learn how to preserve, protect and recover good adaptation and development at the risk exposure or adversity.

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ПОНЯТИЕ ПАССИВНОЙ ЭВТАНАЗИИ В XXI СТОЛЕТИИ

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Традиционно в этико-медицинской и юридической доктрине термином *«пассивная эвтаназия»* обозначают умышленное воздержание от выполнения действий, направленных на поддержание жизни неизлечимо больного человека с целью избавления его от мучительных и невыносимых страданий [1]. Спустя столетия, данный вид «лёгкой смерти» обоснованно приобрёл статус отдельного вида эвтаназии.

Пассивная эвтаназия, рассматривая её с точки зрения пациента, может быть как добровольной – когда об использовании данного метода своевременно была явно выражена просьба со стороны неизлечимо больного человека, так и недобровольной – когда такая просьба ранее не была выражена, а при данных обстоятельствах установить истинное желание пациента уже является невозможным в силу неизлечимого заболевания, отнявшего у субъекта всякую дееспособность, или из-за его малолетнего возраста. Из этого следует, что пассивная эвтаназия не только в теории, но и на практике выявляет два между собой независимых подвида – пассивную добровольную и пассивную недобровольную эвтаназию.

Анализ новейшей литературы разных отраслей науки выявил недостаточно точное понимание термина *«пассивная эвтаназия»*. Главным образом это обуславливается тем, что при рассмотрении данного вида «лёгкой смерти» игнорируется факт, что принцип автономности пациента запрещает медперсоналу применять по отношению к дееспособному и достигшему определённый возраст неизлечимо больному человеку принудительное лечение вопреки его воле, даже если пациент ощущает постоянные мучительные и невыносимые страдания, вызванные заболеванием, и данные действия медицинского характера продолжили бы его жизнь. Таким образом, выявляется дискуссионный как на теоретическом, так и на практическом уровне вопрос – является ли *«пассивная добровольная эвтаназия»* одним из видов «лёгкой смерти» или всё же это юридически корректная медицинская процедура со стороны медиков, уважая выраженную пациентом волю по отношению к своему телу, не имеющая ничего общего с эвтаназией как с методом облегчения страданий неизлечимо больного человека, ответ на данный вопрос оставляя открытым для активных дискуссий и по сей день.

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GLOBAL CLIMATE PROBLEMS AND HYBRID CARS

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Due to depletion of oil resources and climate warming humanity realized the need to seek for alternative means of transport to replace the modern cars, to reduce the huge emissions polluting the air. One such alternative is hybrid cars. Today, there are many hybrid vehicles riding the streets of Lithuania, mostly Toyota Prius and luxury Lexus RX and LS.

Hybrid cars. Toyota began selling the Prius model in Japan in 1977, it was a medium-sized car, and as it is shown by the sales statistics, it upheld the expectations of the customers and became popular. Hybrid car drives off may be parallel or sequential. A hybrid car starts to move the car using the battery power. Above a certain speed of the vehicle the control system runs the petrol internal combustion engine during acceleration and it is used only for the petrol engine. When the car starts to slow down in the brake regeneration system, it stops the use of force into electrical energy which is used for battery charging. Slowing to a certain speed, the vehicle control system disconnects the internal combustion engine and the car stops using only battery power. Hybrid car emissions are much less than for conventional cars with internal combustion engines. Toyota Prius CO_2 emissions are 104 g / km, or approximately 55% less than in the same class of vehicles with emission control devices for CO_2 emission into the environment.

The hybrid car air pollution and fuel consumption are reduced; it is especially important for saving natural resources and reducing pollution, which currently are very relevant. For battery charging external sources are unnecessary. Currently, car manufacturers increasingly introduce new hybrid cars, suggesting that their number in the world should grow.

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TRADITIONAL LATVIAN COUNTRY HOUSE, KURLAND REGION EXAMPLE

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The traditional way of life is not only treatment of things, but also the environment is important with the traditional management. The aim of the development plans is to define the context of the cultural landscape protection and management of premises and areas around the old rural homesteads, having regard to land rights, and it should be targeted for biodiversity conservation processes. In particular, this applies to different historical periods which most directly affected the *Kurland farmsteads* landscapes. They are multi-layered scale and proportion, and include diverse cultural and historical information.

Such areas are important not only locally but also globally. The territory quality characteristics for the identification and development of a nationally important economic role in ecclesiastical architecture are formed as a tourism resource [1].

A drastic change in attitudes towards cultural heritage and traditions took place in Europe after the Cultural Revolution, when it was lost in several areas in the Stockholm suburbs, small towns razed many of the centers and the trigger was the collapse of many of the medieval city centers. Treatment of old buildings and rural fences was as negative as in modern Latvia. Western countries invested heavily in public perception of historical values. Public events were organized, tax incentives for Heritage owners were created, credits relaxed, newsletters mass-issued, exhibitions designed, cities and towns developed in the reconstruction and development projects, promoting traditional crafts, local materials, manufacture, information centers were set up [2].

Highly measurable art is a skill to use and involve ancient *country estate* in the landscape and ancient heritage of the most valuable items in a modern landscape, the synthesis of the modern landscape of cultural value. Synthesizing *traditional Kurland country house* features of a modern landscape, significantly improve the aesthetic quality of cultural facilities. As a result, the visual character of poor quality is reduced, giving new modernist trends of Kurland *traditional country yard landscape areas*. The scientific research results provide an important contribution to the future of rural municipal administrative territorial development to enhance, restore or create new sustainable landscapes, based on a balanced and harmonious relationship between economic activities, social needs and cultural environment [3].

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ANALYSIS OF WOOD PROCESSING INDUSTRY INFLUENCING FACTORS IN LATVIA

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The global wood and timber market was developing very rapidly in the last pre-crisis decade, which contributed to the demand and the global trade growth in this sector. In Latvia the forests are the main renewable resource and the forests cover more than 50% of its territory, and in the world in total forests cover only ~30% of the territory, but in Europe - ~44% of the territory [1].

The forest statistical inventory data show that 47% of the total forest areas are the state forests, but 53% - private forests. During the last 70 years, the forest area in Latvia has almost doubled, while the volume of wood has increased to 630 million m3 after the forest inventory statistical data. The Latvian forest sector is oriented to the production of high quality and high value-added goods [2].

In the study, the influencing factor selection with the factor analysis and the expert method were used.

From the study results it can be concluded that the key affecting factors that influence the wood processing development in Latvia are the following: roundwood and other materials available for the production, imbalance of prices and production costs, trends in the sales markets and competitor countries and a new development direction of wood products.

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PROPERTIES OF ASPEN AND ASPEN CLONES GROWING IN LATVIA

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Eurasian aspen (*Populus tremula*) is the second widely spread deciduous tree species after birch in Latvia (57 milj. m^3 in stock) (Forest inventory data, 01.04.2009). Since the demand for wood as a renewable material is increasing nowadays, search for new sources are under way. Aspen hybrid (*Populus tremuloides* x *Populus tremula*) has been obtained, planted and investigated since the 1960's (Smilga 1978) and interests restart in 1990 with a new point of view and speed in Latvia. In present, the hybrid aspen seedlings are available on the market.

The aim of the present research was to find most important differences in physical and chemical properties of Eurasian aspen and aspen hybrid tree and craft pulp fibres obtained.

97 aspen hybrid and 31 Eurasian aspen wood samples were collected during 2009 and 2010 from an experimental site in the central Latvia, planted in 1964 and 2000 on agricultural lands with sandy soil (*Myrtillosa* forest type). A 2 cm - wide radial strip was cut from each tree disc and the physical properties and chemical content were studied. Images of discs were made by Canon 4400 scanner and measuring of annual rings was performed by image analysis software ImagePro 6 Plus. The content of extractives, lignin and cellulose in wood and pulp has been determined according to the TAPPI and ISO standards. The data were analysed using statistical software SPSS.

The obtained results show that hybrid aspens have a greater annual ring width in comparison to Eurasian aspens. It means the aspen hybrids produced more wood in a year, because hybrids had a longer growth period. Probably they were prone to illness, because they did not stop vegetation before cold was on (Gailis 2005). Young aspen and aspen hybrid trees show higher paper mechanical properties in comparison with old trees.

The main conclusion of the study is that the private land owners and wood processing experts should pay more interest to the hybrid aspen, as the hybrid aspen is appropriate in the wood product market and characterized by good fibre properties.

Acknowledgements

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CAN YOU HEAR THE SILENCE OF MEDIA?

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"If a tree falls in a forest and no one is around to hear it, does it make a sound?" is a philosophical question with a rather individual answer. But what if something happens and no media is there to cover it? Does it happen at all? This is a burning issue concerning millions of people in the democratic world we pretend to live in. And it personally concerns thousands of us, the journalists of the future. Nowadays there are obvious gaps in the news feed of media. However, people already notice that and disagree with it. They do so mainly in the social networks online. But if I want to work in a free and objective media, is the Internet the only “place” for me to do it?

On the 18th January, 2012 more than three thousand people in Bulgaria protested against the shale gas exploration and the forest logging in the country. Only two of four national televisions covered the protest in short videos, not even mentioning the number of people on the streets. Moreover, there was not a single word about Vitosha mountain, which was specifically the other great problem for demonstrators. The reactions – thousands of people disagreeing on Facebook, arguing the lack of public information on the case.[1]

This case actually was quite interesting for me because just a few days later, I happened to be in the Vitosha mountain. Snow not cleaned, electricity – cut, no media interest - except my team there. I talked to the natives - they do feel forgotten by God… and by the media. And, they are absolutely convinced the second ones “forget” them deliberately, for business and political interests.

In this context, I have to note that, according to the media monitoring results of the Institute for social integration, last year the name of the Bulgarian Prime Minister Boyko Borisov appeared 872 times in 7 newspapers and 41 times in the four national television channels. And all this – for 39 days only.[2]

But one last thing - these days it became clear that Bulgaria is one of the twenty two European countries that signed the ACTA. And again – 4 days later, only two newspapers alarmed for this news. And again – people are now organizing demonstrations… on Facebook.[3] What a surprise!

I am a future journalist. Journalism is my science. So, what shall I do if somebody stands on my way towards real journalism? Is the Net the only free media left? And until when? I have to admit I do not know the answer. And the only way to find it is to jump into the deep end …and see if I will survive.

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CLOD SEPARATION FROM HOP FINAL PRODUCT

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Clods detected as impurities in dry hops come from hop growers to the processing line.Their source is muddy soil in the hop gardens during rainy harvest. Soil is formed into rounded clods in the separation machine. Clods come with hop cones to the drying machine and then to the processing line. The designed separation device, located at the end of the drying machine, should not damage the hop cone, or change its humidity; hop cones and free leaflets of the cones must stay together after separation. The process must be continuous for ensuring pressing.

The principle of the device is based on air flow which changes the trajectory of low weight hop cones during free fall. The designed device includes a conveyor belt and radial fan. The conveyor belt and fan speeds were set by the frequency changer. The first, free fall trajectories without the radial fan for comparison with the math calculated values were measured. The calculation was done for two different speeds of the conveyor belt. The lower speed 0,44 $m.s^{-1}$ was choosen because of the drying machine troughtput. The higher speed 1,73 $m.s^{-1}$ was the maximum speed of the conveyor belt. The result of the measurement is that the trajectory of horizontal throw of hop cones and clods was the same inconsiderately with their weight. It confirms the mathematically calculed values. The second, there was a measurement with the radial fan. We observed the change of trajectories due to the air flow. The measurement was sequentialy recorded by camera. The speeds of the conveyor belt were the same as in the first case. The speed of the air flow was changed from 3 to 5 $m.s^{-1}$. The results show that for hop cones separation lower speed of the conveyor belt 0,44 $m.s^{-1}$ is better than the speed of the air flow from 4 to 5 $m.s^{-1}$. The lower speed of the conveyor belt and air flow is better for preventing undesirable separation of hop cones and free hop cone leaflets.

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FOOD ADDITIVES

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Historically, foods were grown, collected, and eaten directly from a relatively unpolluted Earth. Nowadays, a lot of foodstuffs that we buy contain much more than what is indicated on the packaging. Likewise, many of the foods we eat are made by adding synthetic ingredients. If we want to stay healthy and understand our body, we need to know about these unusual substances and know about their effects.

Food additives are substances added to products to perform specific technological functions. These functions include preserving, i.e., increasing shelf-life or inhibiting the growth of pathogens, or adding colouring or taste.

Food additives that are healthy for you are vitamins and minerals which have been added to baked goods, cereal, yogurt and milk, to name a few. But you may not even know that you are being affected by food additives. Effects of food additives may be immediate or may be harmful in the long run if you have constant exposure. Immediate effects may include headaches, change in the energy level, and alterations in mental concentration, behavior, or immune response.

Some people are ready to buy more expensive food just to know that these products are natural. Some people look at the label. They want to know what they are eating. One recommendation: try eating homemade food, preferably home – grown, and you will stay healthy, strong and full of energy.

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FEMALE CHARACTER BETWEEN FEELING AND COMMITMENT (ANNA KARENINA VS. TATIANA LARINA)

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The character of Anna Karenina, beloved by millions of readers, possesses traits that show a profound psychological construct, being an exceptional artistic achievement. Forced to marry Alexandrovich by her family, Anna is deprived of her husband's love (a misfortune that throws her into Vronski's arms). Her deep attachment to his son is the only reason why she is painfully torn between the two men. For Anna, love gives life meaning, this is why she sacrifices the happiness of her child and even her own happiness in the name of love. Beautiful and intelligent, but also selfish, Anna is imprisoned by conventions and falsehood which is why fighting against prejudices bears no meaning to her and her tragic death cannot solve problems of morality and conscience.

Tatiana Larina, on the other hand, the favourite character of *Evghenii Oneghin's* author, is of a different kind altogether. She is (and cannot be in such a common world) another-worldly being, descendant from a strange land, a paradigm of a soul capable of living outside itself, living instead for the tastes, feelings, interests and ideas of others. Tatiana Larina has come to symbolize the Russian woman in essence, her capacity to love and make sacrifices for the one she loves, but also her power to start once more when she is rejected. She is one of the literary women of an overwhelming purity. Dostoyevsky referred to her when he illustrated his principle: *we cannot build our own happiness on others' misery or shortcomings*. Tatiana does not intend to find her happiness in mocking her husband. Due to her faithfulness, her rejection of egocentrism, an acute sense of justice, esteem for honour and a capacity to renounce – she sacrifices herself and her own happiness. The other's happiness is an imperative instead, for which reason she gives herself entirely to her family. Altruistic by nature, she gives up her happiness for the sake of others. This is, in fact, the major distinction between these two feminine characters of Russian literature.

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НОВЫЕ ТУРИСТИЧЕСКИЕ МАРШРУТЫ В НЕСВИЖСКОМ РАЙОНЕ МИНСКОЙ ОБЛАСТИ БЕЛАРУСИ

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Развитие туризма в Беларуси характеризуется неравномерностью применительно к различным административным территориям. В Несвижском районе Минской области традиционным объектом внимания туристов является Несвижский дворцово-парковый комплекс, входящий в состав историко-культурного заповедника «Несвиж». В 2011 году дворец Радзивиллов и другие объекты заповедника посетило более 200 тысяч человек. Абсолютное большинство туристов находилось в Несвиже только один день, в рамках существующих экскурсионных туров. В значительной степени такая ситуация связана с недостаточной развитостью гостиничной инфраструктуры.

Привлечь туристов не только в исторический малый город Несвиж, но и в его окрестности могут новые маршруты. Они проходят по интересным и пока малоизвестным для широкой аудитории объектам.

Водные маршруты проходят по естественным и искусственным водным объектам Несвижского и соседних районов – по Несвижским озерам (протяженность маршрута 10 км), по реке Уша (трехдневный), по реке Неман (до 3 дней).

Велосипедные маршруты: «Познай Беларусь» (3-4-дневный), «Тропами Якуба Коласа» (2-дневный), по Несвижскому району (2-дневный).

По нашему мнении, такие предложения позволят вовлечь в туристскую деятельность жителей сельской местности и снизить социально-экономическую напряженность.

Структура предложений для туристов позволяет принимать разнообразные категории отдыхающих, что создает широкие возможности для укрепления позиций Несвижского района на рынке туруслуг.

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WHAT IS WRONG WITH WOLF HUNTING IN LATVIA

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After centuries of intense persecution, wolves (Canis lupus) in Latvia have gained legal protection as Latvia has become a member of the European Union. The State Forest Service Hunting Department is required to produce The species conservation plan by the paragraph 17 of the Law on Species and Habitat Conservation (in force since 05.04.2000.) that is meant for sustainable management of wolves in Latvia and in the Baltic population. The plan includes a strategy for conservation and management of the wolf population while the conservation priorities and tasks are to be reviewed at least once every 5 years.

The main conservation objectives are to maintain the Latvian wolf population of at least 300-500 individuals indefinitely in the future ensuring continuous species distribution in Latvia and to maintain high environmental carrying capacity and natural ecological functions of the species in the ecosystem.

The wolf hunting quota is set and controlled by the State Forest Service and the hunting season is closed from the 1st of April until the 14th of July.

However, there exist two issues which discredit the current wolf conservation plan. The first one concerns the legitimacy of the current high wolf hunting quota because there does not exist approval by general public for such policy. The second concern is about the effects of such high hunting quota on wolf population in Latvia.

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EXPLOITATION OF LITHIUM ION AND LITHIUM POLYMER ACCUMULATORS

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Lithium polymer batteries are based on certain polymer transition into a semiconductor state entering electrolyte ions in them. The polymer conductivity increases several times. Lithium power sources with electrolytes are currently manufactured and put into circulation. They can be divided into three groups: dry polymer electrolytes, gel polymer homogeneous electrolytes and waterless lithium salt solutions.

At present batteries on lithium base are considered to be more effective and handy according to several parameters: the energy consumption, they show that they have good load readings at high and at low temperatures, discharge after very long time. Lithium ion batteries are used mainly where there is a need for high energy efficiency, small size and weight.

In connection with the fact that the “ageing” effect of lithium ion batteries increases at high temperatures, it is recommended that you keep the mobile phone away from heat sources (human body, the rays of the sun, radiators). Lithium polymer battery applications allow you to resolve two important tasks - to increase the engine operation and to reduce the weight of the batteries.

The use of mobile phones: complete discharge of the battery is often recommended, also charging faster, until the full charge level is not reached (about 20 percent of the remaining volume). You may not charge the battery, which has been a long time in the cold, until it will not warm up to appropriate for the charging temperature 0 ^{0}C. It is one of the most important aspects of the use of batteries.

The use of portable computers: before the first connecting it is necessary to fully charge the portable computer batteries, and then perform calibration of the management system. Calibration is done at full discharge of the battery in case of indipendent load. Laptops battery calibration is carried out 1 to 3 times a month.

Li pol and Li ion batteries are the most important achievement of today’s technology, which allows the use of portable devices anywhere and at any time.

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DEVELOPMENT OF THE COMPANY "LIEPĀJAS METALURGS": BENEFITS FOR THE NATIONAL EXONOMY

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The footprints of the world's economical crisis are still visible in most of the countries around the globe. Even though economical recession was a top issue a few years ago and now is considered past, some countries that are important players in the global economy have only now taken steps to address the problems. The most important thing for any country in such a situation is to have a strong sector for their economy to flourish and develop in order to be able to keep the national economy growing together with the benefits that it can provide, for example, the improvement of the standard of living for all social groups, pensions, opportunities for education etc.

As in the case of Latvia, our economy is mostly based on processing of wood and metals. The leading processing plant in Latvia and Baltic is "Liepājas Metalurgs". Liepāja is the home city of the mentioned company, because at the time of the foundation of the company the city had a large port for those times and Liepāja was the beginning point for the Liepāja - Romnu railway, which allowed the processing company to be connected with the rest of the Russian Empire. The company was founded in 1882, as a drawn wire and nail producer, and during its existence the company has developed to be able to be a leader in metallurgy, therefore paving its way to where the company is at the moment. Being the largest processing company in Latvia, "Liepājas Metalurgs" also contributes to the lives of citizens living in Liepāja, as welfare and prosperity of about 17 % of the citizens of Liepāja depend on the company. To be able to compete in the today's global markets, "Liepājas Metalurgs" has made improvements in the processing cycle. In 2011, the new metal melting furnace was launched.

It can be concluded that "Liepājas Metalurgs" needs to keep on developing and expanding even more and abroad, as due to the innovative character the company ensures itself with everything necessary for success.

"Liepājas Metalurgs" is one of the most important companies within the manufacturing and processing industry of Latvia, as well as can share the best practice in an after-crisis development and has contributed to the growth of the national economy of the country. In a similar way, in each country, the national economy could benefit from a similar experience.

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OCEAN THERMAL ENERGY CONVERSION

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Ocean Thermal Energy Conversion (OTEC) uses the temperature difference between cooler deep and warmer shallow or surface ocean waters to run a heat engine and produce useful work, usually in the form of electricity.

The hydro energy conversion system uses the ocean natural thermal gradient—the fact that the ocean layers of water have different temperatures—to run a heat engine.

OTEC utilizes the world's largest solar radiation collector - the ocean. The ocean contains enough energy power all of the world's electrical needs.

Open-cycle OTEC uses the tropical ocean warm surface water to make electricity. When warm seawater is placed in a low-pressure container, it boils. The expanding steam drives a low-pressure turbine attached to an electrical generator. The steam, which has left its salt behind in the low-pressure container, is almost pure fresh water. It is condensed back into a liquid by exposure to cold temperatures from deep-ocean water.

Closed-cycle systems (Rankine) use fluid with a low-boiling point, such as ammonia, to rotate a turbine to generate electricity. Here is how it works. Warm surface seawater is pumped through a heat exchanger where the low-boiling-point fluid is vaporized. The expanding vapor turns the turbo-generator. Then, cold, deep seawater, pumped through a second heat exchanger, condenses the vapor back into a liquid, which is then recycled through the system.

The advantages are eco- friendly, minimal maintenance costs compared to other power production plants.

The fossil fuels will in the near future be consumed, so we have to find some alternative energy sources. OTEC is a source, which uses the renewable solar collector, the sea, instead of an artificial collector.

The problem is that this investment will be more expensive than the fossil fuel power plants, and it will take a long time before anyone will put some money in this project and outrival the present existing plants.

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TYPES OF COGENERATION SYSTEMS

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Coal energy is one of the types of fossil fuels and non-renewable energy. Fossil fuels like coal, oil and gas are present in the earth crust in fixed quantities and are an inexhaustible source of energy. Coal is an essential combustion material.

Coal has played a major role in electrical production since the first power plants that were built in the United States in the 1880s. In the 1920s, the pulverized coal firing was developed. In the 1940s, the cyclone furnace was developed. Coal is the world's most abundant fossil fuel. The global reserves stand at around 909 billion tons. At the current level of production, this would last for another 164 years. There are two basic ways to mine coal: surface mining and underground mining.

Coal is used to generate electricity because it is a reliable and low-cost energy source. Inexpensive electricity, such as that generated by coal, means lower operating costs for businesses and for homeowners, which helps to boost the economy, moderate inflation, and increase the competitiveness of coal in the marketplace.

92 percent of coal is burnt to generate electricity. The efficiency of modern power plants is currently about 35 percent. Engineers are developing a "clean coal" technology - processes like washing, gasifying, and burning coal at higher temperatures – aimed at improving the efficiency at 45 percent and more, and reducing emissions. The energy content and quality of the coal are dependent upon the content of carbon contained in it. Carbon is the main component of coal. Generally speaking, the energy value of coal is 24MJ/KG besides its different forms.

There are several problems - emissions spawn the acid rain, coal emissions also cause urban smog, increasing the threat of global warming, the emission of gases and materials into the air and water causes many dreadful diseases like lung cancer and influenza.

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RENEWEABLE ENERGY: WIND POWER

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Wind power is the conversion of wind energy into a useful form of energy, such as using: wind turbines to make electricity, windmills for mechanical power, windpumps for water pumping or drainage, or sails to propel ships. In the winter of 1887/8 the US inventor Charles F. Brush produced electricity using a wind powered generator which powered his home and laboratory until about 1900. Many other scientists have been working on wind power developement too, for example, James Blyth, Poul La Cour, Parris Dunn and many more. Rapid technical advances are abundant in wind turbine technology, therefore today's wind turbines differ a lot from their predecessors. The turbine size, power and complexity have developed extremely fast, the size of the commercial turbine has increased by about 100 times in 20 years. The production capacity of wind power in Latvia has been growing in the past few years slowly, because this type of renewable energy is rather expensive (wind power has low ongoing costs, but a moderate capital cost). Nevertheless, Latvia has great potential in wind power gains because wind turbines can be placed in the offshore area. There is a huge wind farm located in Grobiņa in the county of Liepāja, it features 33 wind turbines with a total nominal power of 19800 kW and an estimated annual production of 49 GWh. At the end of 2011, the worldwide nameplate capacity of wind-powered generators was 238 gigawatts (GW), growing by 41 GW over the preceding year. The 2010 data from the World Wind Energy Association, an industry organization state that wind power now has the capacity to generate 430 TWh annually, which is about 2.5% of the worldwide electricity usage. Between 2005 and 2010 the average annual growth in new installations was 27.6 percent. Wind power market penetration is expected to reach 3.35 percent by 2013 and 8 percent by 2018. As of 2011, 83 countries around the world were using wind power on a commercial basis. Worldwide there are now many thousands of wind turbines operating, with a total nameplate capacity of 238,351 MW as of the end 2011.

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RENEWEABLE ENERGY: BIODIESEL

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Biodiesel is made from vegetable oil or animal fat (triglycerides) reacted with methanol or ethanol and a catalyst (lye), yielding biodiesel (fatty acid methyl or ethyl esters) and glycerin as a by-product. It can be used in diesel engines, but some older engines may require some modifications— diesel engines run better and last longer with biodiesel. And it can easily be made from a common waste product: such as used cooking oil. Biodiesel is a much cleaner fuel than conventional fossil-fuel (petroleum diesel) becouse it burns up to 75% cleaner than petroleum diesel fuel, it is environmentally friendly and is renewable. Blends of biodiesel and conventional hydrocarbon-based diesel are products most commonly distributed for use in the retail diesel fuel marketplace. Much of the world uses a system known as the "B" factor to state the amount of biodiesel in any fuel mix.

Cars are not the only machines which can run on biofuel. On 6 October, 2011 a Boeing 757-200 operated by the Thomson Airways carried 232 passengers from Birmingham Airport, UK to Arrecife, using a sustainable biofuels blend in one engine. The flight illustrates the potential for further use of aviation biofuels, in combination with improved efficiency, to reduce emissions from aviation and reduce dependence on fossil fuels. The challenge now facing the airline industry is to source commercial quantities of sustainable biojet fuels.

Biodiesel has many uses, but in colder places people tend to use it not as fuel, but as heating oil. When used as a heating fuel, biodiesel is sometimes referred to as "biofuel" or "bioheat," becouse of its properties. The advantage of heating with biodiesel is that no new heating appliance and no retrofitting is required, but it may require some special storing conditions.

The British train operating company Virgin Trains claimed to have run the world's first "biodiesel train", the Virgin Voyager has been modified to run on eco-friendly fuel and the company is aiming to convert more in the future. The train uses a blended fuel which is 20% biodiesel - to reduce CO2 emissions without harming the engine.

And those are just few possibilities which can be provided by biodiesel nowdays, and hopfully there will be more possibilities in the future.

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TYPES OF COGENERATION SYSTEMS

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Nowadays the market of cogeneration is expanding and various cogeneration systems are manufactured which differ by appearance but work according to the same principle. Knowing the demand for power and its stability we can surely choose between different types of cogeneration systems so that we could create reliable power engineering systems with maximum efficiency, for example, a steam turbine generates the biggest amount of electrical power and generates more heat than a large reciprocating engine, but the latter has greater thermal recovery which is 50%; in the mean time a steam turbine has 0% thermal recovery. From that we can understand that the thermodynamic performance of these different systems can lead to more cogeneration opportunities depending on what type of cogeneration system is used and for what purposes. The future of cogeneration is microcogeneration because of the economical and size aspects and usage variations.

Special attention has been paid to cogeneration system types such as gas turbine (open-cycle,closed-cycle), steam turbine (back pressure, extraction, condensing), reciprocating engine cogeneration systems and the classification of cogeneration systems – topping cycle (four types of topping cycle systems will be briefly explained) and bottoming cycle. Also load patterns of electricity and thermal energy will be shown.

A comparison between different systems how they prove their efficency or how they fail to prove their efficency has been made.

The biggest difference is in the price of materials, system maintainability. Also the system effectiveness in percentage, nominal range, electricity generation and heat rates are the key factors which must be taken into consideration when the calculus is done.

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KONRAD LORENZ'S CONTRIBUTION TO STUDIES OF ANIMAL BEHAVIOUR

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Konrad Lorenz, one of the eminent founders of a new science called the comparative study of behaviour or ethology, Nobel Prize in Physiology or Medicine winner (together with Karl von Frisch, Nicolaas Tinbergen in 1973) and outstanding scientist of the 20th century has created the theory of instinctive behaviour. That has challenged, inspired, influenced not only a considerable number of his students, collaborators and scientists such as zoologists, psychologists, ecologists, zoo curators, naturalists, ornithologists of his time, but still fascinates not only scientific workers but also others of interest in animal behaviour. Lorenz's ideas have gained wide attention, lots of critics and polemics between various schools of scientists. J.P.S.Haldane was critical of Lorenz's sharp distinction between instinctive and learned behaviour. This distinction was inconsistent with Halden's account of the evolution of language and elementary genetics. The feature of Lorenz's instinct concept was his firm and repeated denial that there are any gradual transitions between instinctive and intelligent (learnt, flexible, variable) behaviours, either in the development of an individual or in the evolution of a lineage. By studying young birds, he was able to prove that fixed action patterns appeared as reactions to key stimuli without any previous experience, i.e., without previous learning. At the same time, K. Lorenz studied quite a specific type of learning, called imprinting. The basal principles have proved to be applicable also on mammals, including man.

This study is an attempt to describe his theory and to find out reasons of popularity it has gained and its influence on modern ethology and studies on animal behaviour.

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CAUSES OF FUEL PRICE INCREASE IN LATVIA

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The present paper is an attempt to analyze the reasons of fuel price increase in Latvia. Oil prices on the world market in March (2012) have gone up significantly, US crude oil has exceeded 50 dollars per barrel, the highest level since the early 80s. Now in Latvia the fuel price has exceeded the record 1.047 LVL per liter, which is by 23% more than in March, 2010. Supply and demand are important factors of price determination in a market. The marketplace forces of supply and demand determine the price of fuel. Those principles apply to the fuel service stations as well. If a retailer prices its fuel too high, and without regard to competition, the retailer's customers may drive to another station with lower prices. If a retailer loses enough volume, the retailer may then reduce prices in order to retain its customers. Besides, competition among fuel retailers affects pricing. More choices generally mean more competition for business. Government regulations refer to another important factor since regulatory steps to reduce air pollution influence fuel markets. Another significant influence on fuel prices are taxes, which can vary dramatically across different markets. In addition, the international situation influences the prices in the Latvian market, Nigerian oil rebels in the region, the devastating hurricanes in the USA and uncertainty about Iraq oil supplies, the news of the Greek financial and economic situation. The Latvian Fuel Traders Association (LDTA) chairman said that the current fuel prices in Latvia are primarily affected by both positive and negative events in the world. At present it is difficult to forecast the future oil price developments, as it depends on what happens in the large oil-exporting countries Iran and Syria. The conclusion can be made that the fuel prices are influenced by various factors: supply and demand in the market, the competition, government regulations in the support of cleaner environment, taxes and international events.

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AVERAGE INCOME IN LATVIA

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The present paper is an attempt to analyze an average income in Latvia. The average income can be estimated in terms of average wages and salaries by territorial aspect and by field economic activity. Latvia is a small country divided into six regions – Riga region, Pieriga region (Riga district), Vidzeme region, Kurzeme region, Zemgale and Latgale region. There is an assumption in Latvia: a distant location from Riga (the capital of Latvia) means worse living conditions. This assumption is proved by the statistic data. The comparison of average incomes of employees between Latgale region and Riga region shows that average monthly wages and salaries in Riga are 580 LVL, but in Latgale region they are just 347 LVL. So the average income in Riga is by 67% (233 LVL) more than in Latgale. The inequality is obvious. Latvia has a favourable geographic location for such economic activities like agriculture, forestry and fishing, and hotel and restaurant business. But in case of Latvia it does not mean that these are profitable economic activities for employees. In 2010 there were the following three economic areas the employees of which earned much larger salaries than on average in Latvia. They were: 1) financial and insurance activities, 2) information and communication, 3) electricity, gas, steam and air conditioning supply. Thus the employees engaged in financial and insurance activities earned 929 LVL per month, but the employees of hotel and food service business earned 285 LVL on average per month. The conclusion can be drawn that average income in Latvia is not equally distributed.

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INTERNATIONAL MONETARY FUND OPERATIONS IN LATVIA 2008-2011

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The paper focuses on International Monetary Fund operations in Latvia in 2008-2011. The International Monetary Fund (IMF) is an organization of 187 countries, working to foster global monetary cooperation, secure financial stability, facilitate international trade, promote high employment and sustainable economic growth, and reduce poverty around the world.

The first collaboration with IMF Latvia had in 1992. During the next years the co-operation was regular. The world financial crisis started in 2008. In December the Latvian government was forced to look for IMF bailout. On December 23, 2008 the Board of Directors of IMF in an official meeting decided to allocate 7.5 billion EUR, distributed among IMF, the European Commission, the World Bank and the European Bank of Reconstruction and Development. The percentage of debt was set 3.87% as maximum, and the payback term was set from February 2012 till the end of 2013. All the money was used to cover the budget deficit and refinance the government outside debt. Besides, part of money from the European Bank of Reconstruction and Development was used to solve problems with the Parex bank solvency. Some economists think that the Parex bank collapse was the main reason of the economic crisis in Latvia. IMF and partner organizations set strict conditions: 1) decrease budget costs; 2) reduce inflation till the level of 2.8 %; 3) reduce budget deficit till 3% from GDP; 4) fulfill the Maastricht criteria and be able to introduce euro in 2014. IMF mission in Latvia was officially closed on December 22, 2011. The aims of the mission were completed successfully. The next step is entering the euro zone.

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ON INFLUENCE OF AIR FILTER RESTRICTION ON ENGINE PERFORMANCE

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The study evaluates the influence of motor air filter restriction on the motor vehicle internal combustion engine performance. According to the maintenance instructions issued by the vehicle manufacturer, the engine air filter must be replaced with certain periodicity [1]. Depending on the vehicle type, the periodicity is between 20 000 – 120 000 km. Correct decision of replacement is connected with technically and economically based system of technical servicing. Unjustified replacement of the engine air filter cartridges has an impact on the maintenance expenses and preservation of the resources of nature. A popular opinion which is also exploited in after sales marketing is that a clogged air filter will lead to significant losses of the engine power, increased fuel consumption and exhaust gas pollution. The study evaluates the influence of the value of air filter restriction on some performance parameters of vehicles, such as power, torque and fuel consumption. The author presents the methods of the research, describes the equipment used in the experiments and mathematical methods of processing of the recorded data [2, 3, 4, 5, 6, 7]. The tests were conducted on four different vehicles to evaluate the influence of restriction on different types of engines – naturally aspirated, turbocharged, spark and compression ignition. The results obtained with all the samples have been presented and critically examined.

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THE SOCIAL REALITIES IN IRELAND: IRISH MAFIA, DRUGS, HATE CRIMES, AND HUMAN SEX TRAFFICKING

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According to the Organization for Economic Cooperation and Development's (OECD) Economics Department Survey on the Republic of Ireland, more jobs have been created between 1997 and 2000 than the previous thirty years, and Ireland's rapidly changing profile, with the real level of expansion more than three times the average increase for Europe, has resulted in record number of women moving into the labor force [3]. During the 1990s, economic development through globalization generated such substantial growth rates that Irish employers began having to recruit workers from abroad [2]. Within a short time, both low-wage service sector jobs and certain high-skilled and professional jobs were being staffed by immigrants [2]. By 2000, Ireland was listed as the 11th wealthiest country [3]. By 2005, as measured by Gross Domestic Product per capita, Ireland was the fourth richest country in the world, behind only Luxembourg, the U. S., and Norway [1]. This onset of wealth, however, did not necessarily bring about a utopia. Societal problems simply took up different configurations and re-surfaced in different forms. For example, Ireland now has become the prime destination for illicit drugs in Europe due to its high consumer demand. According to the March 31, 2012 issue of *The Irish Times,* Irish Police seized drugs worth €6.5 million which had been smuggled into Ireland in a consignment of frozen meat. Furthermore, according to the November 12, 2010 issue of *The Irish Times*, Ireland has now become one of the highest per capita heroin injection consuming nations in Europe, surpassing Sweden and Slovakia. With the 2004 EU10 accession, a new form of slavery took into shape with human trafficking for sex in Ireland. The Irish TV program "RTE Prime Time Investigates" aired a documentary "Profiting from Prostitution" in 2012 about the sex industry in Ireland. It confirmed that Ireland has a thriving sex trade where young women are exploited and frequently moved around the country, from brothel to brothel [4]. It showed mostly young migrant women from the new EU member states working in nearly every town and city. Behind these societal problems lurk the ever-present Irish mafia and hate crimes.

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