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SECTION 31. Economic research, finance, innovation, risk management.

USE LOW COST CARRIER STRATEGY AS SOLUTION TO REDUCE AIRCRAFT TICKET PRICE IN IRAQ

Abstract: Air transport is one of the most important sectors growing in Iraq, especially after 2003 and the removal of all restrictions that were imposed for the movement of people prior to this date also air transport are predicted to take advanced place in Iraqi economic. Iraq has the magnificent site in the heart of Middle East and this region which connecting Continents of the world. Iraq has seen a significant growth in the number of airports across his territory also increase of international airlines that work in Iraq but high prices of airline tickets is one of the most prominent problems of the aviation sector in Iraq compared to other airlines in the world prices for same distances, Knowing that most of the companies trying to lower the price in order to attract larger numbers of travelers.

Using of low cost carrier is one of the best solutions that ensure reduced ticket prices and this strategy has succeeded in a lot of areas in the world

Key words: Low cost carrier, Airline, Airplane, Iraqi Airways, Iraq, Baghdad.

Language: English

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Introduction

American airline (Pacific Southwest airlines company was founded in Texas 1967) consider the first airline started the concept of low cost carrier back to 1981, many airline in America followed this strategy, this idea take more time to apply in Europe its start in 1991, start with Ryan Air and Easy Jet (formed in 1995). We can notes the different in time between America and Europe to apply this strategy because America is one country with large area but

Europe different countries and its take time to lifting of restrictions between countries.

In Middle East the progress not satisfy the ambition due to the restrictions between Arab countries and their neighbors in aviation regulation except Arabian Gulf countries which they have Cooperation in this field also State of United Arab Emirates has been achieved a good progress in LLC.

LLC Now has global spread and we can see that in Table 1 the number of LLC operating in different countries. [1][2][3][4]

Table 1

LLC countries operating – 2005.

Country	No. of LLC
Asian countries	31
European countries	41
UK	12
USA	12
Canada	5
Pacific countries	5
South America	4



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countries	
African countries	1
Total	111

Theory of LCC

As we say before, the idea of low cost carrier back to 1980 so there are a lot of problem faced the idea and many solution put for improvement it, we will not go to further the theory but we will explain the basic of theory.

At first we can see Fig.1 which represents the operating expenses of the airline industry and we can decide which section we can work on it to minimize the cost of ticket.

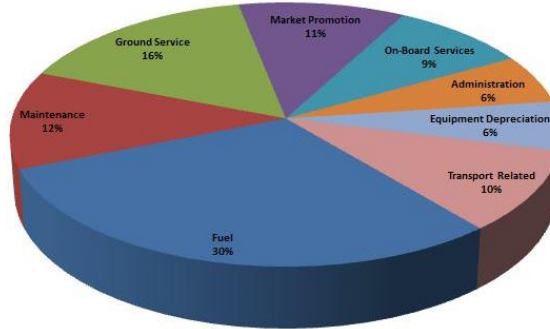


Figure 1 - The various type of operating expenses of an airline [2].

Table 2 shows which strategic measures lead to the reduction in unit costs.

Table 2

Cost distribution of LCC on short- haul flight in relation to traditional operators.

	Cost reduction (%)	Cost per seat
Traditional scheduled airline		100
Low cost carrier		
Operating advantage:		
High seating density	-16	84
Higher aircraft utilization	-2	82
Lower flight and cabin crew costs	-3	79
Use cheaper secondary airports	-4	75
Outsourcing maintenance/ single aircraft type	-2	73
Product/ service features:		
Minimal station costs and outsourced handling	-7	66
No free in-flight catering, fewer passenger services	-5	61
Difference in distribution:		
No agents or GDS commissions	-6	55
Reduced sales/ reservation costs	-3	52
Other advantage:		
Smaller administration and fewer staff/offices	-3	49
Low-cost compared to traditional airline		49

Source Doganis (2007) [5]

Principles of operation

1- One type of passenger class (there are no first or business class)

2- Fleet consists of one type of airplane (such as Airbus A320 or Boeing B737). In this case pilots and the crew of airplane can operate in any airplane in the fleet because it's one type and that

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will save many of training pilots to different airplane.

- 3- Cheap fees, increase with services. LCC don't offer drink or food but you can buy it on airplane the weight of baggage are limited and you will pay for additional weight.
- 4- Unreserved seating or free seating, which contribute in minimize the operation cost, it embolden to buy the ticket earlier.
- 5- Using secondary airports. The advantage of using secondary airports it's less busy than the main airports and the cost of services will be cheap.
- 6- Simplified routes and short Haul flight with fast turnaround time. (Less than 1500 km) and with these distance we get low operating costs per passenger required.
- 7- Electronic ticket, selling directly to customers to minimize the add cost to the ticket by commissions of travel agents. LCC using internet or call center and avoid computer reservation fees. [2] [5] [6]

Iraq aviation: status and possibility

The Iraq Civil Aviation Authority (ICAA)

Is the agency responsible for Iraq's obligations under the provisions of Annex 9 (Facilitation) of the Chicago Convention. The ICAA is responsible for coordinating with other Iraq agencies for the development and implementation of policy and coordination of ICAO matters. The (ICAA) is the specialist aviation regulator in Iraq. Its activities include airspace policy, flight permissions, safety regulations and economical regulations. New carriers wishing to operate in Iraq must receive full approval from ICAA prior to flight commencement. [7]

Approved Airports by (ICAA)

Civilian aircraft flying into or out of Iraqi territory shall only be permitted to make their first landing and final departure from an approved International Airport in order to complete required Customs and Immigration clearance. The current ICAA approved International Airports are:[7]

- Baghdad International.
- Erbil International.
- Sulaymaniyah International.
- Basra International.
- Al Najaf Al-Ashraf International.

In Fig.2 we can see the location of these airports in Iraq map.



Figure 2 - The Iraq main airports.

Iraqi Airways companies

In Iraq there is one national airline company called "Iraqi Airways" was founded in 1945 and we can consider it the first airline company in the Middle East. It was used at the beginning of the British and Soviet-made airplane. In the sixties Iraqi Airways was quick to modernize, buying new jet

airplane, these jets allowed Iraqi Airways to increase service across the Middle East, to Africa and Europe. In the seventies the United States has allowed Iraqi Airways planes using John F. Kennedy International Airport in New York, and because of that, it needed a bigger jet, so they buy Boeing 707, 747 jets. Fig. 3 show as the Iraqi Airways destinations.

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Figure 3 - Iraqi Airways destinations.

Analyzing the case

As we see, Iraqi Airways destinations to different places from different cities, in Table 3 we can see Airplane and passenger traffic in three Iraqi

civil airports (Baghdad, Basra and Najaf) according to the report issued by the General Establishment of Civil Aviation for the period from 8-14 / 4/2015.

Table 3

Airplane and passenger traffic in Iraqi civil airports [8].

Airport name	Baghdad	Basra	Najaf
No. of incoming flights	207	89	184
No. of passengers arriving	19488	7279	21145
No. of departing flights	211	89	184
No. of departing passengers	23825	7430	25183

To simplify we will choose Baghdad airport (the Capital airport) with three destinations that meet the low cost carrier demand and its important destination which is:

- 1- Baghdad - Erbil, flight time 53 min, flight distance 321 km, internal flight, and this route considered one of the most routes use especially

in summer and in many times when the overland route be dangerous between the Middle and North of Iraq. If we compared the price of ticket between let say "Iraq Airways" and LCC in Europe for the same distance, the result in Table 4.

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Table 4

Compared the price of ticket between different company [8] [10] [11].

Departure city	Warsaw, Poland	Baghdad, Iraq	Madrid, Spain
Arrival city	Malmö, Sweden	Erbil, Iraq	Porto, Portugal
Distance in km	645	321	421
Airways company	Wizz Air	Iraqi airways	Ryan Air
Price in \$	22.49	100	17

We measure the distance between the city according to Ref. [9] and we made the reservation to all company in the same date 19/08/2015 for same for same departure day 01/10/2015, one way.

2- Baghdad - Dubai/ UAE, flight time 2 hr. 13 min, flight distance 1389 km, External flight, and this route considered one of the most routes use in all year which connect Baghdad to Asia

through Dubai. If we compared the price of ticket between let say "Iraq Airways" and LCC in Europe for the same distance, the result in Table 5.

Table 5

Compared the price of ticket between different company [8] [10] [11].

Departure city	Warsaw, Poland	Baghdad, Iraq	Warsaw, Poland
Arrival city	Beauvais, France	Dubai, UAE	Beauvais, France
Distance in km	1362	1389	1362
Airways company	Wizz Air	Iraqi airways	Ryan Air
Price in \$	23	208	30

We measure the distance between the city according to Ref. [9] and we made the reservation to all company in the same date 19/08/2015 for same for same departure day 01/10/2015, one way

3- Baghdad - Istanbul / Turkey, flight time 2 hr. 30 min, flight distance 1611 km, External flight, and this route considered one of the most routes use during the all year especially in summer connect the Iraqi capital with Istanbul

which consider the gate to the rest of the world. If we compared the price of ticket between let say "Iraq Airways" and LCC in Europe for the same distance, the result in Table 6.

Table 6

Compared the price of ticket between different company[8] [10] [11].

Departure city	Warsaw, Poland	Baghdad, Iraq	Warsaw, Poland
Arrival city	Barcelona, Spain	Istanbul, Turkey	Barcelona, Spain
Distance in km	1877	1611	1877
Airways company	Wizz Air	Iraqi airways	Ryan Air
Price in \$	82.29	360	95

We measure the distance between the city according to Ref. [9] and we made the reservation to all company in the same date 19/08/2015 for same for same departure day 01/10/2015, one way

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Discussion and Conclusion

As we see in the Tables, there are big difference between the price of ordinary airline company represented by "Iraqi Airways" in our paper and low cost carrier, Although "Iraqi Airways" considered one of the cheap airlines company in the area due to nonprofessional service that provide it and "Iraqi Airways" have problem in planning, organization due to unstable situation in Iraq that made the passenger almost from Iraq only, in our simulation we based on the distance of flight as a criteria and we know this approach give us 80% from the real situation but in total show us the huge reduce in price of ticket. Now we will list the strengths and weaknesses in Iraqi situation.

Strengths

Iraq has great financial ability, cheap efficient workers, special location in the Middle East which consider the link between continental, possibility of

supply the fuel with motivational price "Iraq is one of rich oil country so it's not affected too much with increase the oil price", satisfied aviation structure and he liberated from all constraints which Imposed on him before 2003 so he must organized many things in aviation and investment and create a safe environment to attract the investor from out and inside Iraq.

Weaknesses

One off the most weaknesses is the non-stable situation which effect on the investment in Iraq, administrative corruption and bureaucracy, failure proper planning for aviation sector and non-utilization of International expertise.

At the end, LCC strategy proved around the world but it's only succeed with good planning to all process with high accuracy, and increase the number of a working airlines has great benefit to variety the services which present to passenger.

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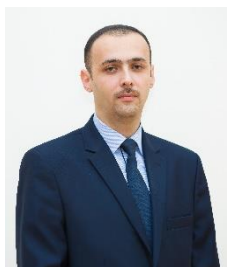
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SECTION 12. Geology. Anthropology.
Archaeology.

ABOUT INVESTIGATION OF SOME INNOVATIVE FACTS ON THE HISTORICAL PAST OF GANJA CITY

Abstract: In this scientific work were systematic researched the main features of historical development of Ganja city as an important Urban civilization center. Some problems of innovative research of ethnographic and historical characteristics of this city have been also investigated on the basis of different scientific sources.

Key words: Ganja, Urban civilization, innovative research methods, historic-ethnographic research, historical past, Azerbaijan.

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*There is a fierce gun, it is not gold.
Ganja still strongly sticks on my collar,
In other case I would seized Iraq's treasures.
A voice came from the World:
- O slave, that's enough fun!
Who is Nizami, and where is Ganja.*

Sheikh Nizami Ganjavi

Introduction

In one of the ancient Zoroastrian's sources there was important information about that Ganja was founded three-four thousand years ago. Thus, the first and important information about, that Ganja was founded 4000 years ago by the one of the ancient Turkish tribes - Sacks - one of aboriginal population of the Caucasus, was reflected in a geographical treatise "Shahrestani Eran" (Iranian cities) that concerned to the 6th century. This geographical treatise was written in Pahlavi language. There was said, that Ganja was founded by famous Turkish commander Afrasiab 4000 years ago. Afrasiab is a historical person and he was the head of sacks-tours, which lived in Azerbaijan (In the ancient sources Turks were named as tours).

Ganjabasar is one of the richest areas from archaeological point of view. As a result of archaeological investigations here were found samples of material culture that concerned to the stages of different history period. Today most of them are kept in various museums of the world.

The flint tools, that found in Gillikdag workshop and camp around Ganja, ladle, that were found by a prominent Azerbaijani archaeologist Isag Jafarzade, give the reason to say, that people, who lived in this area in VII - VI millennium BC were the founders of the Late Stone Age culture.

Archaeological investigations prove that in this period the main population of this region had sedentary lifestyle and were engaged with farming. In V millennium BC in Ganja region all known to us domestic animals were domesticated. This fact is approved with osteology remainders that were found during archaeological excavations.

The anonymous author of the article "Russian city" gave the schedule indicating the date of cities of the South Caucasus, also of Azerbaijan. And here he matched, that Ganja was founded in II century BC.

The same words, that match, that Ganja is older than Barda and Beylagan prove Qagemeyster's information and conception, that says "At a short distance from Barda another city was also flowering, which at the time of destruction



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substituted it. It was Ganja city. Their origin, probably, was the same...".

The biology teacher of the secondary school of Yelenendorf (Goy gol) Yakov Hummel, who has German nationality, with the power of students circle of the school carried out archaeological research works on the right and left banks of Ganjachay, in the Gillikdag area near Goy Gol, in Zurnabad, Balchılı and has gained valuable materials of Bronze Age and Early Iron ages. The value of found materials was so great, that with their account has been created Yelenendorf Museum of Country Studies in 1927.

Materials and methods

Most of the historical monuments, that show, that national wealth of our nation Ganja city has a 4000-year history, today in great museums expositions of the world have unique place. In Metropol (USA) Munich, Berlin, Hamburg, Louvre, Paris, Moscow, St. Petersburg and other cities in the state and private museums rare and valuable exhibits of the history of ancient Ganja are preserved.

Ganja, that has changed its location at least 4 times since its establishment, is located in a favorable position from the strategic point of view. That why it always has been the center of attention of foreigners. Ganja, that was the victim of a terrible earthquake many times, also was the subject of attacks of Mongols, Kharezmshahs, Georgians, Arabs, Russians and other invaders. Ganja has turned to the arena of war damage of different countries of the world. But in spite of it didn't shaken, and using the genetic power revived and developed, and rose to the level of great cities.

The famous Arabian historian and geographical scientist Ibn al-Athir valued Ganja as the hero-city and said: "Tatars (Mongols) after robbing and ruining Beylagani and it's around moved to Ganja. But when Tatars knew, that its population is big, they have shown bravery in the war with Georgians and the strength of this city, they couldn't go there".

Protecting the status of capital city Ganja, in the various stages of the history, had an important role in the preservation of the ancient statehood traditions of Azerbaijan. At the end of the VII century Ganja was the provincial city of Arabs, in the X century the capital of Arran, in the XI century Seljuk's, in the XII-XIII centuries was the residences of Atabek's empire. During this period Ganja had renaissance time of its development, science, culture, trade, crafts reached the highest peak.

As a result of scientific researches by the well-known arabist and scientist on Nizami's work Bertels have proved, that during the terrible earthquake in Ganja in 1139, 300 thousand people died. This fact is reflecting the city's power and greatness again. For comparison, it is also appropriate to note that, in the middle of the XIII century, in the great European city

in Paris, lived nearly 100 thousand and in London nearly 40-50 thousand people.

Ganja city, that gave to the world such great thinkers and word masters as Nizami Ganjavi, Abul-Ula Ganjavi, Mahsati Ganjavi, Raziyya Ganjavi in XII-XIII centuries restarted its high status and became one of the great cities, that kept alive the whole science, culture and state traditional system of the East.

Sheikh Nizami also has got both of the primary and secondary, and scientific education in his favorite city in Ganja. He had two main reasons, why he didn't go to Baghdad and other centers of science. He loved his native city, land, was charmed of it, and also he knew, that Ganja had the high scientific potential. So the great thinker has never left his homeland and thought about it.

In other words, if the poet would have the power to leave his native city, he moved to the center of Caliphate to Bagdad, and collected great treasures with unexampled art. For this reason, great memoirist of Middle Ages, who saw beside "Khamisa", "Divan" with 20 thousand stanzas Douletshah Samargandi stated "an honorable place of birth Sheikh Nizami is Ganja". Don't forget that, genius as Nizami can't be unfounded. For appearing they need historical with ancient traditions, socio-economic and cultural environment. The existence of such environment again proves that Ganja has 3 thousand year history. Because for turning one city to the scientific and cultural center it needs an ancient tradition and a long period of time.

During XV century Ganja was included to the states Garagoyunlu and Aghgoyunlu and managed by different rulers. During the rule of Uzun Hasan Agqoyunlu Ganja's trade relations with other cities were widen and it has resulted its re-development.

By the opinion of research scientist M.X.Heydarov, in this century one of the great trade-craft centers of Azerbaijan was Tabriz, Ardabil and Khoy and also Ganja. In Ganja appeared craftsmanship organizations that based on ideology "Akhilik" and the most important professional form of organization - Trades unions were active.

During Safavid's ruling Ganja was one of the important cities of Azerbaijan and the whole East. Ganja -Karabakh's beylerbeylik was one of the big provinces of Safavid State on territory.

Province's broads were continuing along the Kura River on the north to the west from the place, where Kura River connected with the river Araz, to Bargushad pin (the province are considered) in Irevan and on north direction passing through the eastern part of the lake Goycha again to the north, entered to the Tiflis province, and rose up to the province of Lori.

At the beginning of the XVIII century, Ganja City has retained the status of largest and most important city. At the end of XVII century - at the

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beginning of the XVIII century, a number of travelers, who visited Azerbaijan, have given wide information about its size and beauty.

Netherlands traveler Kornelia de Bry wrote about Ganja so: "Ganja is located on 50 lye distance from Shamakhy, it is bigger than Shamakhy for four times, there are stone buildings there, most of them are two floors, it has beautiful and great karvansarays, deputy has large and wide palace there. The beautiful river flows on the city's territory, there are many gardens, good wine and plenty of fruit here. So, this city of can be considered as one of the most important cities of the East. This information was given to me by the French missioner and several Georgians that lived in this city".

Conclusion and Recommendations

However, the political problems and foreign military intervention to Azerbaijan in the first half of the XVIII century made a lot of Azerbaijani cities, also Ganja city suffered and was the reason of its destroying and completely turning to ruins.

This situation did not continue for a long time. In 1747 after Nadir Shah's killing palace's aristocrats a result of conspiracy, his empire collapsed. Many small government entities on the territory of Azerbaijan - khanates appeared. One of these khanates was Ganja Khanate that appeared around Ganja city.

New danger on Ganja was activation of the policy of Russia in the South Caucasus.

After successful military operations against Osman's Turkey and its close ally - the Crimean khanate in order to enhance their success in the South Caucasus Russian government prepared an action plan.

One of the Javad Khan's contemporaries S.S. Kovalesky in 1880 in notes about Georgia gave such kind of opinion: "Javad Khan from the Qajars family in 50 years old with his intelligent and policy and also good negotiation who found a good reputation".

In November of 1803 year Ganja was attacked with the Russian forces. In the first weeks of attack strong resistance of the city's defenders made Russians maneuver, made them replaced often marches with long-term siege. Russian troops by blockading city, keeping people without water and food wanted to make people surrender. For this reason, Tsitsianov kept the city in blockade without water and food untill epidemic was spreading. In spite of all difficulties Ganja people preferred statehood and independence above all by values and didn't surrender to enemy.

As a result, the living force of Russian troops and war supplies were better, and military operations have been resolved in their favor. Ganja's occupation among the defenders, and also the population led to massive losses. According to Tsitsianov's information on the 8th of January 1804 year, among

the defenders 1,500 people were killed, 17224 male and female were prisoners of war.

On the 8th of March 1804 year, in the letter to Tsar Tsitsianov asked to change Ganja's name: "If Your Excellency like my proposal, I would like to dress up city's name with the Holy name of Her Excellency empress Elizabeth Alekseevna: Yelisavetpol".

Tsitsianov, who got Emperor Agreement, as signed such kind of direction: "After 1 month of declared of Tsar's prescript after or from April 1, if someone in acts matches Ganja with the old name not as Yelisavetpol, it will be a penalty in the amount of ruble."

After the restoration of independence of Azerbaijan Republic, Javad Khan became a symbol of our courage, patriotism and bravery.

Worthy successor of the great leader Heydar Aliyev's political course President Ilham Aliyev said: "I know that Ganja people hold the memory of Javad Khan daringly. Really he is one of the notable sons of Azerbaijan people, is an example of perseverance and courage. His grave in the center of the city is not in accordance with his memory. I think that we should raise a mausoleum. The city will take a new form of architecture, and also Javad Khan's memory will worthy become eternal".

Exactly as a result of the attention and care of country Head with the support of Heydar Aliyev's Foundation in 2005 in Ganja was built a worthy mausoleum for Javad Khan. Historical emblem of Ganja Khanate was restored; film about Javad Khan was released.

At the end of the XIX century, in connection with the emergence of the capitalistic relations, one of the cities of Azerbaijan, where were the processes of formation of its main classes, bourgeoisie and proletariat was Ganja. The development of capitalistic relations in the different fields of city economy, its attraction to all-Russian market speeded this process.

"Turkish Revolution Committee of social-federalists", that showed the exceptional services in the establishment of the Azerbaijan Democratic Republic in 1905 and creation "Difai" Party in Ganja, that was founded in order to protect our nation from the Armenian terrorism, once again showed, that Ganja people could bate all their creatures for traditions, statehood and independence.

Thanks to the representatives of the national bourgeoisie patriots, formed in Ganja, under the leadership of Nuru Pasha was created the Caucasus Islamic Army that saved Azerbaijan from the Armenian and Bolshevik forces ruthless genocide and created an incentive of the future of our country. For this reason, the capital of Azerbaijan Democratic Republic, that declared its independent in May, 28 in 1918, became Ganja. The leaderships of our first national state were outstanding and public men and

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statesmen, who have belonged to the noble family of Ganja.

On April 27, in 1920, after Azerbaijan Democratic Republic's overthrown by the Bolsheviks that supported by bloody actions of XI Army, just only Ganja for the first time raised its statehood independence and freedom voice against the Soviets. The arbitrariness of occupying army, shooting of innocent people, made Ganja people to begin Ganja rebellion against foreigners in a glorious page of history.

Brother of Great Uzeyir Bey Jeyhun Hajibeyli said about Ganja uprising full and exact thoughts: "Ganja's uprising is a story that again earned nation's honor. In May Turkish blood wiped spot, that the road to our nation during events on 27 April. Thus, Ganja began its soviet period of its history with revolt."

According to decision on July 30, in 1918, Ganja's name, that was called Yelizavetpol Province, returned to itself, but in 1935 with the instruction of Moscow Ganja's name changed again into Kirovabad. Thus, Ganja got name of S.M.Kirov, who played an important role in establishment the colonial regime, and Autonomous Oblast for armenians in our land.

Since 1969, under the leadership of national leader Heydar Aliyev there were regarded the works to return Ganja's historical face. First of all, the historical monuments of the city that have fallen into a bad situation, (especially mosques) were restored. However, the main issue of concern for the national

leader Heydar Aliyev, was the return of the city's historic name. At that time, this ancient city was given the name of S.M.Kirov, who was the favorite of communists of Russians. It was not easy to retrieve was the previous name of city. Despite these challenges, one of the major persons was thrower by national leader Heydar Aliyev in 1980. Thus, in the same period in Kirovabad was created two new district and one of them was given the name Ganja. Also, the new housing area, that was built here, was called "New Ganja".

In that years, there were established such kind of great cultural objects as the poetry theater, named after Nizami, Art Exhibition Hall, Children's Art Gallery, Children's Sports Games Complex, "Sherefkhanli country song's theater", "Abulfaz Nakhchivani", "Xezine" ("Treasure"), "Nizami Ganjavı-Pushkin" libraries, Ganja State Philharmonic, Chamber Orchestra, "Nizami Ganjavı's house museum". In general, the number of such kind objects, that were created in Ganja in 1969-1982, was more than 40.

After the collapse of the Soviet Empire, our motherland Azerbaijan was testing on hard and difficult fate, the economic, social and political tensions created the fear of losing of country independence. In such difficult circumstances, thanks to the management capacity and fine political feeling of national government prevented civil war in the western region and protecting Azerbaijan's independence. So in Azerbaijan began a new development stage.

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SECTION 11. Biology. Ecology. Veterinary.

EVALUATION OF PROINFLAMMATORY OF HUMAN RHINOVIRUS

Abstract: This study was conducted on 96 patients from Abdul Sahib Dakeel health center in the province of Najaf during the period from December 2014 to February 2015, the purpose of this study was to evaluate proinflammatory (IL-6 and IL-18), for patients than controls (18 year) who ranged age patients between (15-45 year) were divided into two age ranges (15-30 and 31-45) year. The virus was isolated from nasal secretions for the purpose of diagnosis of the virus in two ways (rapid test and real time pcr) in addition to the blood samples to assess the proinflammatory (IL-6 and IL-18). Seventy eight case of the study showed that the positive samples of percentage (81.25%) and eighteen case was negative percentage (18.75 %) is through examination (rapid test and real time pcr) and examination of the nasal secretions. While the results of the proinflammatory showed a very large rise in the level of probability ($P < 0.05$) of each of (IL6 and IL18) in the serum of patients, The study showed a high concentration of IL-6 and IL-18 on the seventh day compared to the results after two weeks and three weeks compared with the control group .

Key words: RT-PCR, IL-6, IL-18, RNA, VP1, VP2, VP3, VP4, IL-1, IL-17, TNF- α , IL-4, IL-10, IL-13, IL-2, ICAM-1, VCAM-1, GM-CSF, TH2, Tcells.

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Introduction

Human Rhinovirus was associated with acute exacerbations of chronic respiratory disease. The viral proteins were transcribed as a single, long polypeptide, which is cleaved into the structural and nonstructural viral proteins. A single-stranded positive sense RNA genomes of between 7.2 and 8.5 kb in length. At the 5' end of the genome was a virus-encoded protein, and like mammalian mRNA, there is a 3' poly-A tail. Structural proteins were encoded in the 5' region of the genome and non structural at the 3' end. This was the same for all picornaviruses. The viral particles themselves were not enveloped and were icosahedral in structure.[1]

Human rhinoviruses were composed of a capsid, that contains four viral proteins VP1, VP2, VP3 and VP4. VP1, VP2, and VP3 form the major part of the protein capsid. Sixty copies of each of these proteins assembled as an icosahedron. [2,3]

Human rhinovirus of primary route of the entry was the upper respiratory tract (mouth and nose). Cell lysis occurs at the upper respiratory epithelium.

This virus occurs worldwide and is the primary cause of common colds. The symptoms including sore throat, runny nose, nasal congestion, sneezing and cough; sometimes accompanied by muscle aches, fatigue, malaise, headache, muscle weakness, or loss of appetite. [3]

The infection occurs rapidly, with the virus adhering to surface receptors within 15 minutes of entering the respiratory tract. High risk individuals includes children and the elderly. Just over 50% of individuals will experience symptoms within 2 days of infection. Only about 5% of cases will have an incubation period of less than 20 hours, and, at the other extreme, it is expected that 5% of cases would have an incubation period of greater than four and a half days.[4]

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IL-6 is a member of the IL-6-type family of cytokines, which includes leukemia inhibitor factor, ciliary neurotrophic factor, and oncostatin-M. Its receptor consists of an IL-6-binding chain (IL-6Ra) and the signal-inducing component (gp130). IL-6R exists in membrane-bound and soluble forms. [5]

IL-6 is a multifunctional, pleiotropic cytokine involved in regulation of immune responses, acute-phase responses, hematopoiesis, and inflammation. It is produced by endothelial cells, fibroblasts, monocytes, and macrophages in response to different stimuli (IL-1, IL-17, and TNF- α) during systemic inflammation. In innate immunity, IL-6 directs leukocyte trafficking and activation and induces production of acute-phase proteins by hepatocytes. [6] IL-6 promotes T-cell proliferation, B-cell differentiation and survival, and plasma-cell production of IgG, IgA, and IgM. [7]

IL-18 is a member of the IL-1 family that promotes the production of various proinflammatory mediators and plays a role in cancer and various infectious diseases. It was originally identified as IFN- γ -inducing factor and is produced by cells of both hematopoietic and nonhematopoietic lineages, including macrophages, dendritic cells, intestinal epithelial cells, synovial fibroblasts, keratinocytes, Kupffer cells, microglial cells and osteoblasts. The production of IL-18 is structurally homologous to that of IL-1; it is produced as an inactive precursor of 24 kDa, which lacks a signal peptide [6].

IL-18 also induces IL-4, IL-10 and IL-13 production, increases IgE expression on B cells and in association with IL-2, it enhances stimulus-induced IL-4 production from TH2 cells. Bone marrow-derived basophils produce IL-4 and IL-13 in response to a stimulus from IL-18 and IL-3. IL-18 in combination with IL-12 induces IFN- γ from dendritic

cells and bone marrow-derived macrophages. Adhesion molecules, ICAM-1 and VCAM-1, are induced by this cytokine on synovial fibroblasts and endothelial cells. It inhibits osteoclast formation via its induction of GM-CSF from T cells. The receptors of IL-18, IL-18R α and IL-18R β , share their signaling mechanisms via the IL-1R family. Toll-like receptors also share the downstream signaling pathway of IL-18 and are known to regulate IL-18 expression. [7]

IL-18 plays a critical role in host defense against bacterial, viral, fungal and protozoan infections. One predominant mechanism is the induction of host IFN- γ production, which activates several effector pathways including nitric oxide production, resulting in the clearance of the invading pathogens. For viral infections, the effects of IL-18 are mediated not only via IFN- γ but also by activation of CD8 $^{+}$ T cells. IL-18 binding protein (IL-18 BP) is the naturally occurring antagonist that may serve as a negative feedback mechanism for IL-18 as several isoforms of this antagonist have been identified. [8]

2. Material and Methods

2.1. Samples Collection

This study was isolated of human Rhinovirus during a period extended from 15 December 2014 upto 15 of February 2015. A total of 78 (45 (57.69%) females and 33 (42.30%) males) with infected patients in age ranged between (15-45) years of clinical samples were randomly. Specimens were prepared according to Lennette, (1995) and OIE, (2009).

2.2 Detection of Rhinovirus

Two different diagnostic procedures were used for detection of Rhinovirus including, rapid device test (CerTestSpain), [9] and real time PCR using the primer design viral RNA kit (primer design UK) in accordance with the manufacturer's instruction successfully amplified. (Table.1).

Table 1

Detection primers of Rhinovirus.

HRV primer 1 (5'-GAA ACA CGG ACA CCC AAA GTA-3'),

HRV primer 2 (5'-TCC TCC GGC CCC TGA ATG-3')

2.3. Evaluation of Pro inflammatory (IL- 6 and IL-18)

Have been diagnosed with the Rhinovirus, as mentioned in the steps for each kit of (Cat. Number: SEA079Hu and SEA064Hu, Uscn Life Science, U.S.A).

2.4. Statistical analysis

The analyses were performed by using one-way ANOVA through the SPSS (statistical package for social science) program (version-19) and Excel application.

3 Results

3.1 Rapid Test

A total (96) different clinical cases collected, only 78 cases were positive while (18) negative as detected by rapid test in figure(1). The age ranged between (15-45) years old divided into two groups. Twenty case of (15-35) years fifty six case of (36-45) years, compared with control group as in figure (2 and 3).

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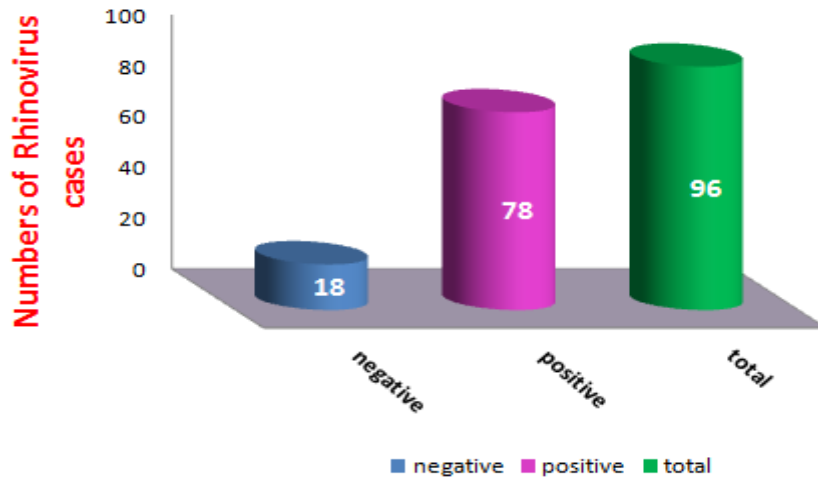


Figure 1- Diagnosis of Rhinovirus by Rapid Test of Numbers of Cases Infected.

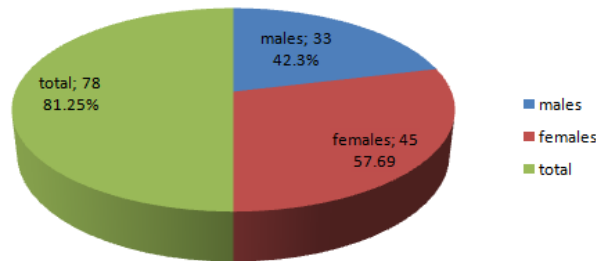


Figure 2- The distribution of patients according to gender groups and presentation.

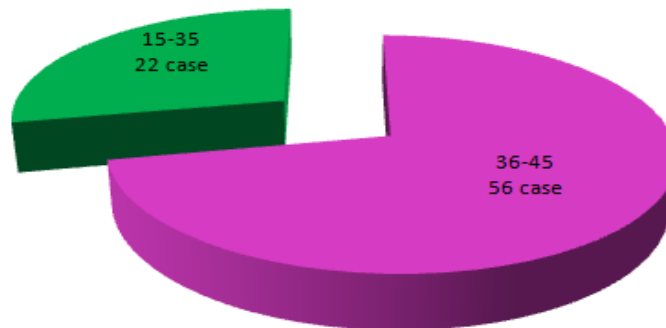


Figure 3- The distribution of patients according to age groups and presentation .

3.2. Real Time PCR

Of a total 96 suspected of virus infected cases only 78 positive case were detected as Rhinovirus

infected with rapid test device. All the positive cases were undergone diagnosis with real -time – technique in figure(4).

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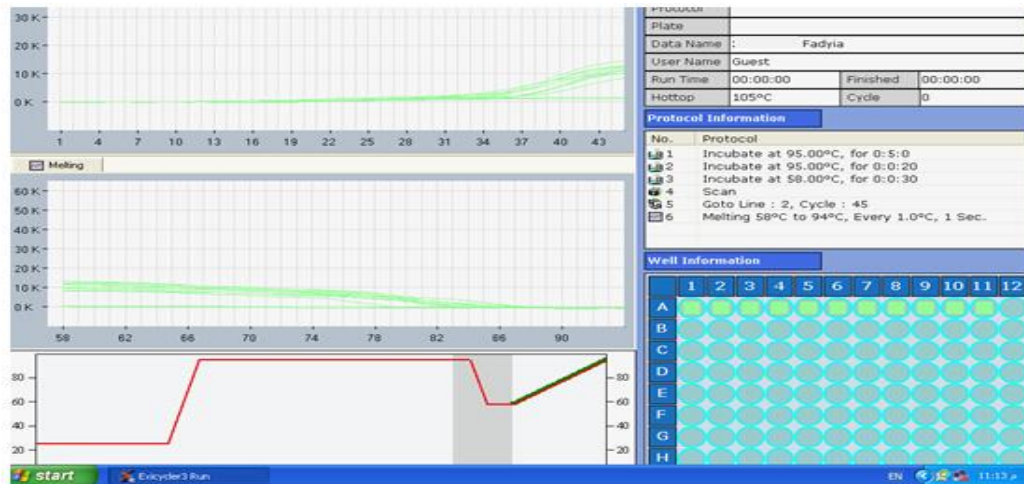


Figure 4- Detection of Rhinovirus by Real time PCR.

3.3.ELISA assay of human proinflammatory (IL-6 and IL-18).

The present study revealed marked increase in proinflammatory (IL-6 and IL-18) in sera of infected patients with the control . The IL-6 and IL-18 were a marked increase the peak values after the seven day (1.344 ± 0.28 pg/ml and 1.356± 0.22 pg/ml) and after fourteen and twenty one day (1.328 ± 0.29 pg/ml and 1.320± 0.31 pg/ml)

respectively in comparison with the control value of (0.616±0.18).

IL-18 was a marked increase in the level of patients group comparison with the IL-6 which reached its peak after fourteen, twenty one day (1.347±0.26 pg/ ml 1.341± 0.29 pg/ml) of infected patients respectively than the control group (Table 2).

Table 2
Mean titers of proinflammatory IL-6 and IL-18 of infection patients.

Proinflammatory	Groups and number	7 day	14 day	21 day
IL-6	Infected (n.78)	1.344±0.28	1.328±0.29	1.320±0.31
	Healthy human (n.18)	0.616±0.18	0.616±0.18	0.616±0.18
IL-18	Infected (n.78)	1.356±0.22	1.347±0.26	1.341±0.29
	Healthy human (n.18)	0.616±0.18	0.616±0.18	0.616±0.18

4. Discussion

The samples of Rhinovirus was collected from nasal secretion, and sera of patients, this results agreed with that found by Jacobs,*et al.*,(2013); Costa *et al.*,(2014). Among ages 36–45 years, more vulnerable to infection during the study appeared to be independent of age. The study showed the

percentage of females (57.69%) are more affected than males (42.30%) , results also were in agreement with other studies, documented by (Zlateva *et al.*, 2014). Leung *et al.*,(2001) and Chen *et al.*, (2007) were found that levels of IL-6 and IL-18 appear to increase of level titer.

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SECTION 7. Mechanics and machine construction.

THE STATE OF LOADED DETAILS BY RIVETED JOINT

Abstract: The article presents the character of the stress and strain of materials details by riveted joint under the action of multidirectional loads.

Key words: the riveted joint, deformation, biaxiality.

Language: Russian

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СОСТОЯНИЕ НАГРУЖЕННЫХ ДЕТАЛЕЙ ЗАКЛЕПОЧНОГО СОЕДИНЕНИЯ

Аннотация: В статье представлен характер напряжения и деформации материалов деталей заклепочного соединения при действии разнонаправленных нагрузок.

Ключевые слова: заклепочное соединение, деформация, биаксиальность.

Заклепка – это соединительный элемент, имеющий форму стержня, на котором с двух сторон выполняется головка различной формы [1].

Наиболее часто применяются заклепки с полукруглой головкой. Материалами заклепок являются стальные и цветные сплавы обладающие высокой пластичностью и прочностью.

Неразъемное соединение нескольких деталей заклепкой применяется в случаях действия на узел значительных вибрационных и ударных нагрузок, невозможности сваривания и ограничения нагрева материалов соединяемых деталей [2]. Данный способ соединения до сих пор применяется (как единственный рациональный или возможный) в авиастроении, в судостроении, в строительных сооружениях и в общем машиностроении.

Заклепка подвергается срезу, смятию и изгибу от действия разнонаправленных нагрузок (сил) на соединенные детали в одной или нескольких плоскостях [3]. Стержень заклепки деформируется (изгибается) в направлениях действия нагрузок. Возникают касательные напряжения, максимальная величина которых будет достигать в поперечном сечении стержня заклепки на стыке пересекающихся отверстий нагруженных деталей. Контактные напряжения

между поверхностями стержня заклепки и двух отверстий приводят к смятию материалов деталей. Повторные нагрузки увеличивают деформацию и снижают прочность материалов заклепки и соединенных деталей. В результате приведенных возможных деформаций, стержень заклепки может частично или полностью разрушиться и тем самым произойдет разъединение заклепочного соединения.

Расчет напряженно-деформированного состояния деталей заклепочного соединения позволит выявить критические области нагруженных материалов и прогнозировать долговечность эксплуатации сборочной единицы.

Габаритные размеры и конфигурации заклепки с полукруглой головкой и двух соединяемых деталей (пластин) были приняты в соответствии с ГОСТ 10299-80 [4] и ГОСТ 10304-80 [5]: диаметр стержня заклепки $d = 16.0$ мм; диаметр головки заклепки $D_3 = 25.0$ мм; высота головки заклепки $H = 9.5$ мм; радиус под головкой заклепки r – не более 0.8 мм; радиус сферы головки заклепки $R = 13.0$ мм; длина стержня заклепки $L_3 = 40.0$ мм; длина каждой соединяемой детали $L_n = 80.0$ мм; ширина каждой соединяемой детали $B = 80.0$ мм; толщина каждой соединяемой детали $h = 20.0$ мм; диаметр сквозного отверстия в каждой соединяемой детали $D_n = 16.1$ мм.

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На всех кромках деталей заклепочного соединения были выполнены радиусные фаски размером r 0.2 мм. Материал заклепки и соединяемых деталей – сталь 10 ГОСТ 1050-88 [6].

Решение выполнялось в модуле Static Structural программного комплекса Ansys. Не изменяющиеся по величине нагрузки прикладывались в одной плоскости.

Длительность действия сил на поверхности деталей заклепочного соединения – 1.0 с. Разбиение твердотельных моделей заклепочного соединения было выполнено на 207355 конечных элементов.

Твердотельная модель заклепочного соединения в трехмерной постановке и действующие равные нагрузки представлены на рис. 1.

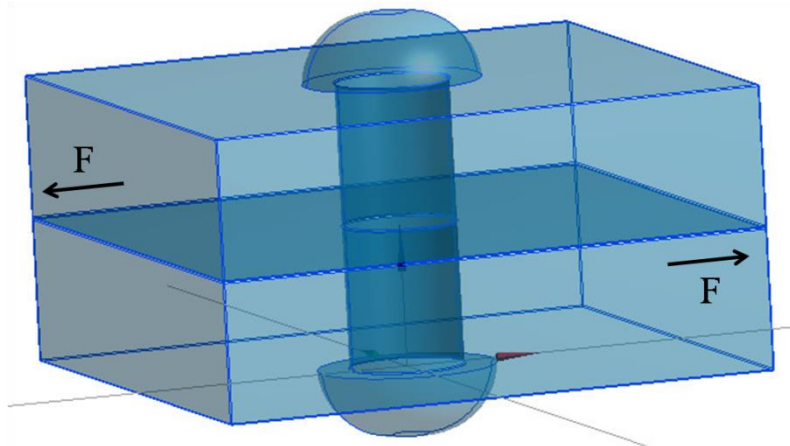


Рисунок 1 – Трехмерная модель заклепочного соединения. F – направление действия постоянной нагрузки.

Значения коэффициентов биаксиальности для каждой деформированной детали соединения представлены на рис. 2. Биаксиальность – это коэффициент, определяемый как отношение

знакопеременного минимального напряжения к знакопеременному максимальному напряжению [7].

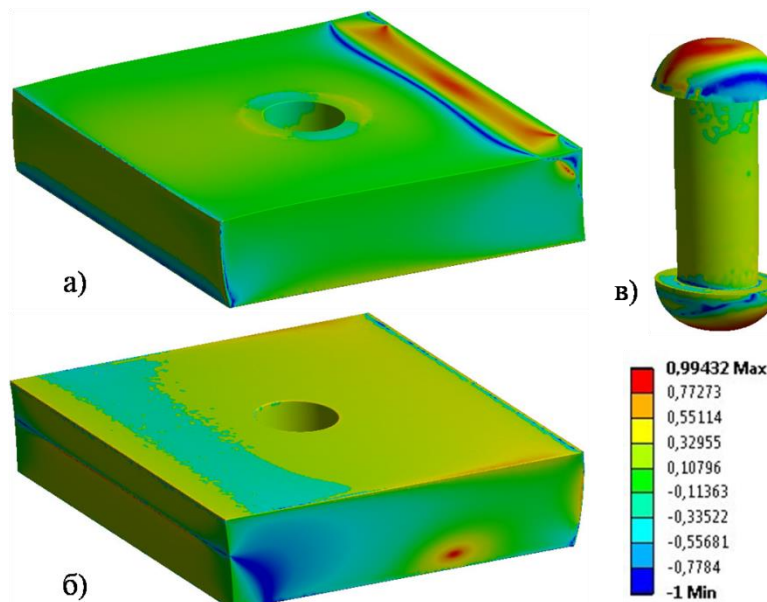


Рисунок 2 – Индикаторы биаксиальности: а – верхняя плита, б – нижняя плита, в – заклепка.

Расчетные величины коэффициентов биаксиальности составляют от 1.0 до -1.0. При коэффициенте биаксиальности, равном 1.0, первое, второе и третье напряжения (нормальные

и касательные) в точке равны. С уменьшением значения коэффициента биаксиальности с 1.0 до 0 величина третьего главного напряжения уменьшается, а первого главного напряжения

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увеличивается. Аналогичные расчеты выполняются и для отрицательных значений коэффициентов биаксиальности. Положительные величины коэффициентов биаксиальности характеризуют растяжение материала детали, отрицательные – сжатие.

В соответствии с индикаторами биаксиальности, стержень заклепки подвергается растяжению. Значение коэффициента составляет 0.1...0.3. Головка заклепки находится в равнонапряженном состоянии: сжимающее действие на периферии и растягивающее действие ближе к оси детали. Поверхность отверстия верхней соединенной детали испытывает растяжение (желтый цвет на модели) и сжатие (голубой цвет на модели). Отверстие детали начинает вытягиваться в направлении действия силы. Отверстие нижней соединенной детали равномерно растягивается.

Таким образом, в исследуемой схеме нагружения заклепочного соединения большая интенсивность напряжения наблюдается в верхней соединенной детали.

Направление и интенсивность полной деформации каждой детали заклепочного соединения отображены на эпюрах векторов (рис. 3).

Полная деформация деталей заклепочного соединения рассчитывается как алгебраическая сумма линейной и угловой деформаций возникающих по трем координатным осям и плоскостям [8]

$$\varepsilon_{tot} = \left(\varepsilon_x + \frac{\alpha_{xy} + \beta_{xy}}{2} + \frac{\alpha_{xz} + \beta_{xz}}{2} \right) + \left(\varepsilon_y + \frac{\alpha_{yx} + \beta_{yx}}{2} + \frac{\alpha_{yz} + \beta_{yz}}{2} \right) + \left(\varepsilon_z + \frac{\alpha_{zx} + \beta_{zx}}{2} + \frac{\alpha_{zy} + \beta_{zy}}{2} \right),$$

где α и β – углы наклона граней элементарного параллелепипеда (продольное сечение формы стержня заклепки).

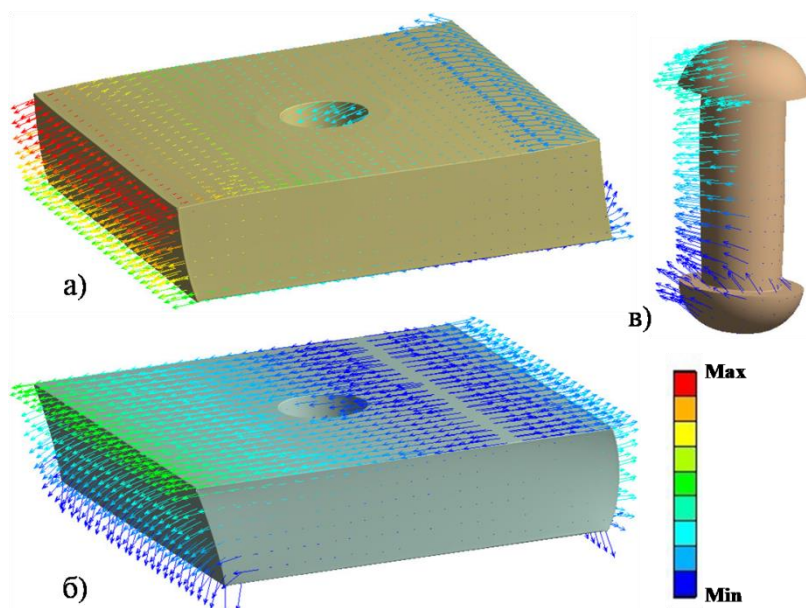


Рисунок 3 – Эпюры векторов полной деформации: а – верхняя плита, б – нижняя плита, в – заклепка.

Направление деформации материала заклепки соответствует направлению действия нагрузки на верхнюю деталь соединения. Можно отметить, что возможному разрушению неразъемного соединения будет способствовать значительные изменения геометрических форм верхней и нижней деталей. Ввиду того, что абсолютная деформация заклепки может иметь как положительные, так и отрицательные значения, то при суммировании деформаций, полная деформация на некоторых участках будет равна практически нулю. Срез (разрушение) заклепки в условиях неравномерной деформации

может произойти в месте перехода диаметра стержня в буртик головки.

Представленная картина напряженно-деформированного состояния деталей заклепочного соединения внахлестку позволяет судить о запасе прочности соединительного элемента с учетом геометрических размеров стержня (длина и диаметр) и толщины пластин. Отношение деформации стержня заклепки к деформации поверхности детали, на которую действует нагрузка, составляет 1:3 (рис. 3, а) и 1:2 (рис. 3, б) когда расстояние от края пластин до оси заклепки составляет $L_n/2$.

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SECTION 8. Architecture and construction.

THE DEVELOPMENT AND PROSPECTS ANALYSIS OF BUILDINGS THERMAL PROTECTION STANDARDIZATION IN UKRAINE

Abstract: In recent years in Ukraine, as in other countries, thermal buildings regulations have significantly increased. The energy-saving policy should be further continued together with implementing energy-efficient buildings.

Key words: thermal resistance, thermal protection, energy saving, rationing.

Language: English

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For almost half a century, there have been significant changes in the thermotechnical qualities standardization of general purpose building envelopes. First of all, the importance of the normative (economically viable), and, respectively, the actual thermal resistance of external walling has significantly increased. However, even nowadays, the total heat loss through the buildings' envelopes makes in Ukraine about 350 mln GJ/year, to compensate which it is required to burn about 14 billion m³ of gas. Through walls these losses reach 170 mln GJ/year of heat, to receive which it is required to burn almost 6.5 billion m³ of gas, and through windows it makes more than 155 mln GJ/year (about 6 billion m³ of gas) [1]. The heat energy consumption for heating multicompartment buildings ranges from 350 to 600 kWh/m² per year, while in Sweden and Finland it only makes 135-150 kWh/m², i.e. 3-4 times less [2]. The thermal protection standards of civil buildings, which were in force in Ukraine in the period from 1994 to 1997, were still lagging behind the regulations in a number of countries, though they increased the required thermal resistance of building envelopes by 2-2.5 times and more. If compared with such countries as Germany, Denmark, Great Britain, our standards yielded insignificantly, however, they were lagging behind the norms of Sweden more than twice. The specific energy consumption in residential buildings of Sweden is the lowest among foreign countries. Therefore, an energy-efficient house in the country is

heated on a cold winter day with an armful of firewood, or with 2 liter of oil fuel to obtain the temperature of 20°C in each room. The thermal resistance of the civil buildings walls in Sweden reaches 8.0 m²×K/W. It should be noted, that the heat insulation effect-cost ratio has the most optimum value at the increase of the walls opaque portions thermal resistance from 0.8 to 2.8 m²×K/W and for window frame structures it ranges from 0.4 to 0.8 m²×K/W. The provided, according to DBN (Construction Rules and Regulations) B.2.6-31:2006 "Thermal Buildings Insulation" [3], in 2007, raising the requirements to heat-transfer resistance for opaque areas (walls) up to 2.8 m²×K/W gives significantly higher (almost three times) overall effect, than that obtained with a gradual increase of this index to 2.5 m²×K/W. Further increase of the opaque walls heat-transfer resistance exceeding 3.5 m²×K/W does not have so significant impact on the total economic effect at a fixed energy products price [4,5].

The data obtained by MNIITEP (Moscow) confirm, that further raising the walls thermal resistance when R₀>3,5 m²×K/W does not give such an observable effect in energy consumption, as at the previous stages, when this index was reduced by 25%. If we continue raising the heat-transfer resistance from 3 to 5m²×K/W, the power consumption will be only reduced by 3-5%. However, in recent years, Russia and the Baltic



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countries (Lithuania, Latvia, Estonia) have significantly raised the buildings thermal protection standards and the value of heat-transfer resistance is much higher than $3.0 \text{ m}^2 \times \text{K/W}$. For example, in the Moscow experimental residential area of Kurkino, the so-called "warm" houses were built, where the specific heat consumption for heating and hot water is by 3-3.5 times lower than in houses that meet the requirements of the heating- performance standards [6] of that time. All exterior envelopes have increased heat-transfer resistance: the walls - 6.5, coating - 8.6, basement floor - 9, windows - $1 \text{ m}^2 \times \text{K/W}$ [7]. Exterior walls make a layered self-supporting structure of the "ventilated cladding" type, where a half-brick walling performs the function of a screen, thus permitting to fulfill the investor's requirements of the brick house simulation.

Despite the fact that formerly DBN B.2.6-31:2006 [3] standard was sufficiently advanced, in recent years, it is no longer economically viable.

Approved late in 2012, Change No. 1 to these regulations has significantly raised the requirements as to the minimum values of walling structures heat-transfer resistance R_q^{min} . For the 1st temperature zone, which area has significantly increased (including 20 regions out of 25), this index has risen from 2.8 to $3.3 \text{ m}^2 \times \text{K/W}$ for walls. Therefore, the effective thickness of walling made of different materials is significantly increasing. The dynamic pattern of the specified heat-transfer resistance and the effective thickness of the walls made of different materials are shown in Fig. 1. However, taking into consideration the Ecofys studies, there are recommendations on further raising the standard R_q^{min} values: for walls – up to 5.0; for coatings – 5.9; for ground floor – $3.9 \text{ m}^2 \times \text{K/W}$ [4], which considerably exceeds the standard values of thermal insulation adopted both in Ukraine and in other countries with similar climate.

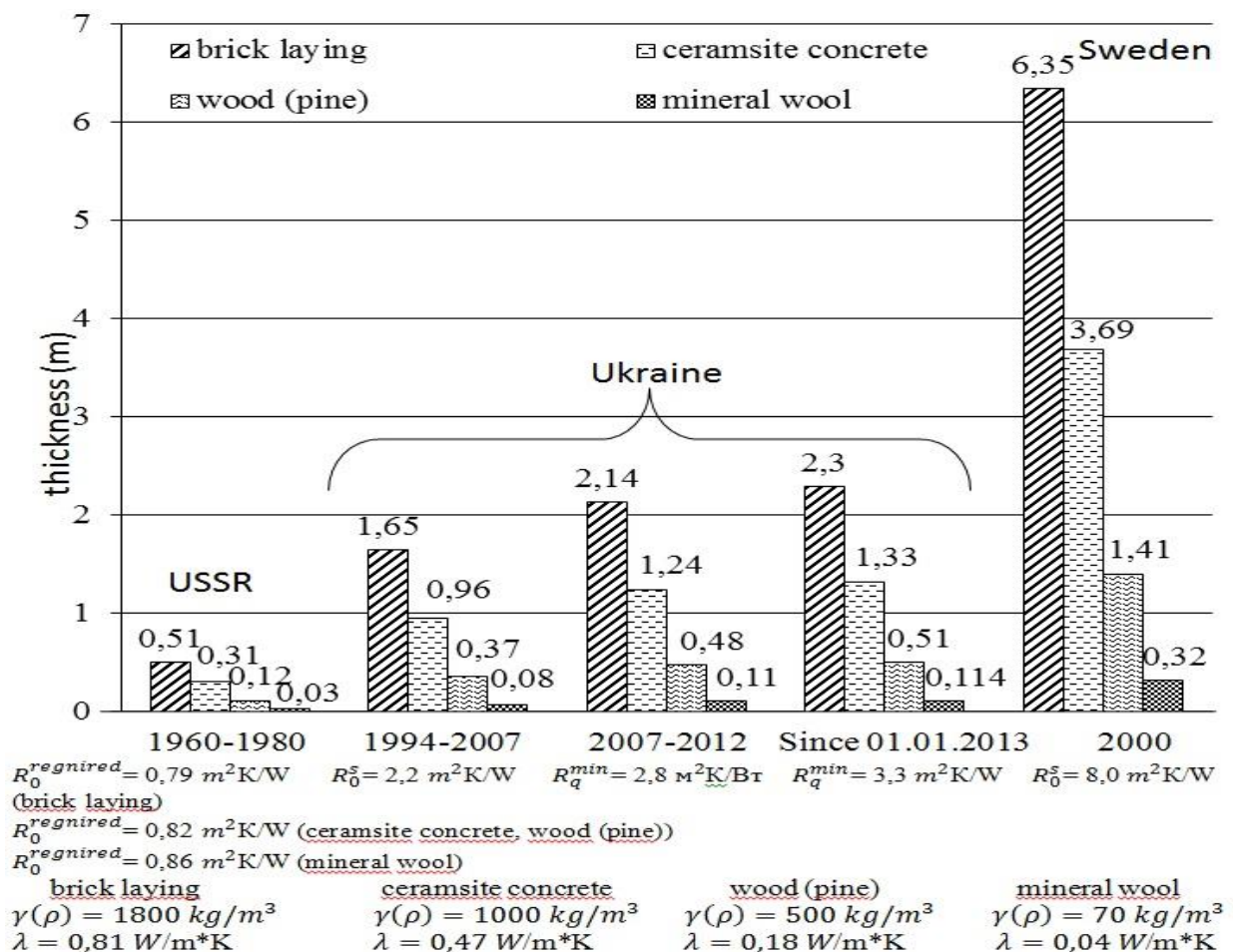


Figure 1 – Diagram of the outer walls expected thickness for civic buildings according to thermal protection standards for different periods.

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The thermotechnical calculations updating also helps to solve the problem of energy saving, the most volatile and the least studied parameter being the atmospheric air temperature. The results of the studies [9,10] permitted to calculate the values of the temperature, taking into account the expected working life of the building and the thermal inertia value of the building's envelopes.

Thus, the analysis of the national and world experience testifies to the necessity of further energy saving policy, implementation of energy-efficient buildings with consideration of the energy market

situation, using the advanced countries' achievements, avoiding their mistakes in this respect. High level of the buildings thermal protection and the use of efficient, high-quality thermal insulation will also improve the ecological situation and reduce environmental pollution, though, of course, it will require additional simultaneous inputs for manufacturing and using up-to-date, efficient thermal insulation materials. The payback time of these measures will depend on the ratio of capital and operating costs (of energy products), but we obviously have no alternative to the above measures.

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SECTION 30. Philosophy.

THE REVIVAL OF SPIRITUAL VALUES IN THE CONTEXT OF TRANSFORMATION OF SOCIAL PROCESSES IN UZBEKISTAN

Abstract: *In this article the revival of spiritual values in the modern conditions of independence development and transformation of social processes in the Republic of Uzbekistan is consider. There are some human qualities as kindness, historical truth, tolerance, family values, spirituality of people, interethnic harmony, religious values, moral values, harmonious developed youth, ecological consciousness and others are analyzed.*

Key words: *Uzbekistan, spiritual values, new generation, historical truth, historical memory, transformation of social processes, national values of the Uzbek people.*

Language: *English*

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In his book "High spirituality – an invincible power" the President of the Republic of Uzbekistan Islam Abduganievich Karimov noted "During the years of independence the main challenge for us was and is the education of a free citizen who knows their rights, politically literate who can engage in critical thinking, hopes only on their knowledge and capabilities, in a word comprehensively developed person" [8, p. 76.].

The last decades of the XX century and the beginning of the twenty-first century are characterized by ambiguous often painful processes in all spheres of life of the people.

The process of reform, of renewal in all areas of our life, after independence took place in a complex and ambiguous environment.

In the Republic of Uzbekistan is observed, as expressed the American political scientist Samuel Huntington, a return to the roots, or as they say in Russian literature, the revival of spiritual values of the Uzbek people. If the growth of national consciousness in the countries that are in some way depend on the West was caused by the costs of the unification process of the lifestyle in the image and likeness of West, in the former republics of the USSR, excessive centralization and acceleration of the process of cultural assimilation. The revival of spiritual values does not mean the rejection of former conquests and values. It is supposed to be more

respectful of the culture, psychology and mentality of the people, but primarily the ability to show and prove to himself and the world the uniqueness and originality of its people, its originality, including in the area of spiritual and moral achievements.

Wide promotion of the best samples of national and world culture should be the basis of the spiritual education of the younger generation, the youth of today. Spiritual revival is the emergence of a new generation, a new youth, thinking which defines the spirit of independence. Spiritual revival is the emergence of a new generation of creative young people, thinking which defines the spirit of independence. The return of interest in our history, our origins, our historical memory, wide promotion of the best images of our national and world culture – all this forms a new civic consciousness and is the source of spiritual education of our young people today.

About the revival of spiritual values, says the President of Uzbekistan I. Karimov: "There is leaves filled with historical events of the twentieth century. What will be the path of humanity in the twenty-first century, what will be his fate that lies ahead? What are the prospects of independent Uzbekistan, boldly invading the world community that may disturb the peace, quiet procession of the young state on the path of economic reforms?" [6, p. 5-6].



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It must be emphasized that this problem has aroused much interest not only in the country but abroad. This is natural, because the place of Uzbekistan in the world, his policies has a huge impact on the solution of many problems not only in Central Asia but throughout the world.

No society can see their future without the development and strengthening of spiritual potential, spiritual and moral values in the minds of people.

Cultural values of the people, his spiritual heritage for millennia served as a powerful source of spirituality for the people of the East. Despite strict ideological pressure over a long period the people of Uzbekistan have managed to preserve their historical and cultural values and traditions, which are carefully passed down from generation to generation.

From the first days of our independence, the most important task, is raised to the level of state policy, was the revival of that huge, priceless spiritual and cultural heritage, which for many centuries was created by our ancestors.

The revival of spiritual values we consider as an organic, natural process of growth of national consciousness, the return to the spiritual sources of the nation, to its roots.

Since gaining political independence and freedom of our people has become a true master of his destiny, the creator of his own history, the bearer of a distinctive national culture.

However, it is necessary to emphasize that the return and restoration of the spiritual and Holy to us religious values and traditions, the knowledge of ourselves was held in difficult conditions - the conditions of the collapse of the old Imperial system and the emergence of new social relations.

After more than a century of totalitarian according to this process, at first, quite naturally took place as a kind of "negation of the negation". But we were aware that the negation of the values of the former system contains the risk of political and cultural extremism that have no constructive program. However spontaneous and unconditional return to the values, traditions and way of the past can lead to the other extreme - to the rejection of modernity, rejecting the need of modernization of society.

It was in the wake of this denial appeared the danger of extremist opposition, which, in fact, could be the opposition of spirituality. Her political aspirations is a mixture of militant nationalism, religious intolerance and hatred to the whole "not our". Our society could not be seen in a specific extremist manifestations of those days, how aggressive was this reaction, how much it destructive and hate everything that did not fit into the narrow framework of individual perception politicized militant groups.

Awareness of the danger of such developments dictate the need for a deeply thoughtful and balanced

approach, design and implementation of a set of mutually reinforcing political, economic and cultural programs aimed at increasing positive, constructive nature of spiritual revival. These programs were based, primarily, on the obligation of a differentiated approach to reviving the legacy choice, first of all, the most important, ethically significant their traditions and customs, enriching human values and meet the requirements of democratization and renewal of our society.

With a special significance in the extreme conditions of that period acquired weaken and prevent emotional outbursts that could easily switch shaky line, a line from which is an ethnic conflict. This danger was ubiquitous in those days, and to this day there is convinced that only a call to mind will tolerance and humanity of our people has helped us to take this no measurable consequences of the disaster.

Essential in the process of revival and growth of national consciousness and, if you will, of national pride is the historical memory, the restoration objective and truthful history of the people of his native land, the territory of the state.

The history becomes a true educator of the nation. Acts and deeds of great ancestors evoke historical memory, form a new civic consciousness, become a source of moral education and imitation. In the history of the Central Asia there were many prominent figures, combining political intelligence and moral virtue, religious outlook and encyclopedic erudition. Our great ancestors such as Imam Bukhari, At-Termizi, Naqshband, Haji Ahmad Yassavi, al-Khorezmi, Beruni, Ibn Sina, Amir Timur, Ulugbek, Babur and many others had made an enormous contribution to the development of our national culture, become truly the pride of our people. These names, their outstanding contribution to the development of world civilization known today throughout the world.

Historical experience, the continuity of traditions - all of these should be the values on which new generations are brought up. Not accidentally, our culture has become a center of attraction for all mankind: Samarkand, Bukhara, Khiva - a place of pilgrimage not only for scholars and art lovers, but for all people of the Earth who are interested in the history and historical values.

Ethnic, cultural and religious tolerance of our people is another inexhaustible source of spiritual revival. For thousands of years, the Central Asia was the center of the meeting and the coexistence of different religions, cultures and lifestyles. Ethnic tolerance and openness were the natural norms for survival and development. even those who conquered these territories, not only admired the culture of the peoples of the Central Asia, but also carefully over the tradition, the elements existed in the territory statehood.

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It was on this earth was a global enrichment of world cultures for many centuries. Here for centuries, nomadic peoples coexisted with settled, Iranian tribes with Turkic Muslims from Christians and Jews. And the last two centuries, when even States who consider themselves "civilized" and "enlightened", mired in mass pogroms and religious persecution, the land of Uzbekistan not only remained a place of peaceful unification of peoples and cultures, but also gave shelter to the representatives of persecuted peoples.

The revival of the spirit of the Uzbek people, the formation of moral ideals of the nation is a phenomenon in which deep national inextricably linked to universal. Without losing its identity, the peoples living in Uzbekistan have their common mentality, a common philosophy of conduct. Hence a single moral core that all the years of independence has been a source of inter-ethnic harmony.

The revival of the spiritual and religious foundations of society, culture of Islam that has accumulated millennial experience moral formation of our people, was an important step on the path of self-determination, gaining historical memory, cultural and historical unity. Reconstructed old mosque and built new ones; expanding the network of educational institutions; published religious literature.

Spiritual revival should apply in the relations of man to the earth and its resources. In the region where agriculture for thousands of years was based entirely on irrigated agriculture, respect for the land and water is equally important moral imperative than respect for the objects of civilization. Earth, air, water and fire (the Sun) was anciently revered in the Central Asia; they came to pay homage to all the religions of our ancestors, from Zoroastrianism to Islam.

Unfortunately, most damage over the last century was caused to the ecological system of the region was forgotten traditional environmental ethics of our ancestors, prohibiting thoughtlessly to defile and wasting water and land resources.

Especially it is necessary to emphasize the need to study and popularize the tradition of rational and harmonious use of nature in pre-Islamic culture of the peoples of the Central Asia. It is no coincidence that our earth was the birthplace of Zoroastrianism,

summoning people to care about maintaining the cleanliness of rivers and soil fertility. other teachings - Buddhism and Manichaeism also preached caring and respectful attitude to nature as one of the most important ways to perfect society. Not coincidentally, these same ideas of the harmony of the relationship between Man and Nature we find in the teachings of a Central Asian Sufism, made a huge contribution to the Muslim Renaissance in the Movarounnahr.

Another powerful source of spiritual values is the traditional ethics of the family and kinship relations, the basic principles which have always had respect for elders, mutual aid, care for children. Unfortunately, these values have been severely deformed in the Soviet period. Banning private enterprise, suppressing, under the pretext of "nepotism", the continuity of professional skills in families and genera, the Soviet regime contributed to the loss of the families and genera of their traditional professional and economic "niches". As a result, these skills and moral standards, having been blocked, began to take socio ugly cronyism and nepotism. When they do this kin mutual aid was sometimes result in dependency and protectionism hindering the development of society.

The revival of family values and kinship should mean not perpetuating tribal relations, but the possibility of economic, cultural and professional emancipation of each family.

The revival of spiritual values means also their adaptation to the values of the modern world and the information civilization.

Positive values brought about by modern civilization, we refer to the values associated with the process of building a legal democratic society. It is the respect for human rights, freedom of enterprise, freedom of speech, freedom of the press, etc.

Human in man is formed not mechanical consumption of cultural values and spirituality contained in them. In life you often meet people educated, with broad knowledge, learned well the different requirements of society, but at the same time being extortionists, selfish, i.e. spiritually poor. Therefore, spirituality is not foreign "culture," and internalized the content of culture, evolving into an inner conviction, world outlook, initial demand, the positive qualities of the person.

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SECTION 30. Philosophy.

THE SYNERGISTIC NATURE OF THE STRUGGLE BETWEEN GOOD AND EVIL IN ZOROASTRIANISM

Abstract: In this article the ideas of good and evil considered in the holy book of the religious and philosophical teaching of the Zoroastrianism the Avesa from the standpoint of the synergetic approach are analyzed.

Key words: Zoroastrianism, the Avesta, good and evil, nature and man, synergetic approach, dialectic.

Language: English

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Today, in most former Soviet republics, there is a restoration of forgotten and lost traditions and customs are being revived national spiritual values, are taken steps to restore historical justice, violated more than seventy years of domination of the totalitarian system. In the Central Asian republics and in particular in Uzbekistan, these processes are quite effective. A large part of our population is Muslim, however, of great importance in the state is paid to the revival of ancient customs and traditions – as the native spirituality of the people. Primarily this is done for the younger generation, which must be harmonically well-rounded, and most importantly, knowing the history of his country, his native land, his ancestors. After all, memory is the life of the people. If living memory – alive and the people with its unique features. If destroyed the memory – and the man turns into a mankurt.

Crucial in the life of people has the ratio of such ethical categories like good and evil. From the point of view of synergetics the good and the evil is a kind of "essence" fighting among themselves, and the result of this struggle for the people – the adoption of one or the other.

The good and the evil is not some extreme points on a continuous rating scale of "better – worse", not some abstraction, which everyone understands as he likes, not the particular traits of individual people, and the world principles underlying all laws of the Universe. The world is not indifferent to good and evil, as many believe today. Good and evil are two main forces that act in our era,

and the struggle between them is the essence of this era. The source of goodness is God; the Creator of the world (Ahura-Mazda), the source of evil is the devil, the destroyer (Angra Mainyu). All that is God is good, all that is the devil, is evil. God is always doing good and can't (Yes, mannone can) to do evil, the devil always does evil, and cannot do good. Good and evil are mutually exclude each other and can breed with each other. Between good and evil is a constant war, and even a temporary peace between them impossible. Here, if very briefly, the main provisions of the doctrine.

However, it's completely wrong to say that Zoroastrianism somehow equates good over evil, puts them on the same level, and considers them to be equal participants in the creation and development of the world. So think many proponents of the term "dualism" as applied to Zoroastrianism. Between good and evil, according to the doctrine, there is a fundamental difference. First, the good has always existed and will exist forever, and evil has appeared at a certain stage of development of the world and will inevitably be destroyed when comes the appointed time. Second, infinitely good and evil are always limited. Thirdly, good self-sufficient, it can exist without evil (and there is much better than evil), but fundamentally evil cannot exist without good. Good is a creative force, it can create from itself, and evil is solely a destructive force that, in principle, not able to do anything but new destruction. Good is our world created by God in his development, harmony,



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with all its laws, and evil is the destruction of the world, the violation of its laws.

The relationship of good and evil is similar to the relation of the human body and disease (or parasite): a man can live without illness and disease without the person can not, it exists only as long until it has something to destroy; the parasite does not create anything new (except perhaps other parasites), living by the weakening and eating the body. People like the world, is a complex, infinitely varied system. But the disease or parasite, as the evil, primitive compared to him, as their task is much easier: break — not to build. But precisely because of this stupidity, because of this specialization on the destruction of evil, like a disease, it is extremely difficult to deal with: it easily adapts to a changing external environment, moreover, it is infinitely varied in its adaptability, because otherwise he simply can not survive. Evil, like disease, can lay low, wait for the most opportune moment, and then we can begin an active process of destruction. Evil, like disease, can affect only weakened the body, with loose internal connections and deranged by the interaction of individual parts. And these parallels can be multiplied.

Where did evil, and why God, the Almighty Creator of the world, made its appearance, did not destroy it in the future? This question baffled by many other teachings, which they are careful to avoid, but Zoroastrianism is responsible to clearly and consistently. The basis of the world order in the beginning of Creation was based on the principle of freedom of choice of all entities that freedom, without which it is impossible no development. That is, originally was the potential for the existence of evil, as true freedom of choice inevitably involves the ability to make this choice in the direction of strengthening and harmonization of the world, and its destruction, both towards God and towards the devil. However, before the entity having the right of choice (including people), didn't make a choice in favor of evil, the devil could not break into the world and begin their destructive activities. That is we the people, have allowed evil to manifest, to become stronger and then become a huge force that significantly affect our life.

We incorrectly used (and continue to use) our freedom given to us to develop our abilities for self-improvement, to get closer to God, in whose image we were created. This freedom given to us for a certain period, and that during this period, evil will exist. Then it inevitably will be destroyed and will not be able to manifest. But up to this point only on us having the right of choice, depend on the quantity and strength of evil in the world. So the existence of evil is the inevitable price to pay for the opportunity of our development, our teaching, the laws of the world, our fulfillment. However, this does not mean that we have to choose evil, on the contrary, ideally,

our desires should be consistent with the desires of the Creator, must remain within the framework of good, but we must come voluntarily, without any coercion.

Of that good and evil are fundamentally different from each other, what is good evil far more advanced, it is absolutely wrong to conclude that in all circumstances, always and everywhere good is stronger than evil. Not at all. For example, in our earthly world due to our efforts and our mistakes very evil has increased, and now his power is comparable to a force for good. Moreover, if things go well, we can bring our little earthly world to complete destruction, that is, to the triumph of evil. Of course, this will only be a local victory of the forces of destruction, only a temporary success, which then will create great difficulties, as they will have to find a new object of destruction, but we have something that does not help. We have to be responsible for what we failed to save entrusted to us part of the world. As for the forces of good, we your wrong actions, wrong choice themselves refuse their help and allow evil to come between them and us is almost impenetrable wall.

According to the Avesta, in the development of our world there are four stages, four eras. The first era is called the Era of Creation. During its God created the world in perfect, non-incarnate form, defined his laws, set the relationship of the individual parts. This ideal world was holistic, harmonious, perfect, it was not and could not be evil, since there was nothing else to destroy, and was incarnate of the entities, having the freedom of choice. In this world reigned Truth, Beauty, integrity of world called Arda, or Asha, preserving and harmonizing power. By the way, this is the beauty, which, according to F.M.Dostoevsky, will save the world. But this ideal, perfect world was not realized, it lived a full life, not evolved.

So for the first era was followed by a second — Era of Mixing of good and evil. The Creator began to transport the world in the incarnate state; therefore, there is a possibility of a wrong choice of entity, the possibility of world destruction. And in the beginning of this era the world was invaded by evil, brought disharmony, violated the natural course of events, has become a parasite on the world, to flourish. It is in this second era we now live, but it is already nearing its end. As the name implies of the Era of Mixing, good and evil at this time is mixed, it is sometimes very difficult to distinguish from each other. This is the time of our determination, our development, expression, comprehension of the laws of good and rejection of evil, of realizing their mistakes and corrects them. Before the end of this era the evil will inevitably exist.

But then will come the third era — the Era of distinguishing between good and evil. Its essence lies in the ultimate victory of good, in the defeat of evil



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in the creation of an environment in which evil will never be able to manifest. At the beginning of the Era of distinguishing will be the trial of all entities having the right of choice that will determine all of them a proper punishment or reward. By the end of this era of evil will be finally separated from the good, all men (all) will be cleansed from evil and saved, and the forces of evil destroyed.

Then comes the fourth era, completing the cycle of development, the Era of the Merger and the triumph of wisdom, when all parts of the world will merge into a single stream of harmony and love. What will happen next, we don't know, probably, the world will go to some new level of development.

The eras of the development of the world have truly cosmic duration, each of them takes billions of years, so during our earthly life, our current incarnation, we, of course, do not notice their influence. But every man, according to Zoroastrianism, eternal, true life never stops, so in reality we go through all of these eras, while staying all the stages of the world. Note also that these four stages of development, according to the law of similarity, observed in much shorter cycles, although with its own characteristics.

In the external teachings of Zoroastrianism says nothing about the cycle of reincarnations. But in the esoteric doctrine, zurvanism, the doctrine of the multiplicity of human lives, about his karma (sarame), opportunities to escape from the circle of developed exhaustively. This is the teaching of the whole Avestan astrology, allowing tracing the shaping of human destiny and the realization of accumulated destiny, the path of self-development of personality and the influence of external forces. Multiple incarnations of a person is new and new lessons to him. Each earthly life gives us another chance of development in the new circumstances, another opportunity to realize their place in the world and its purpose, another attempt to start over and make the right choice between good and evil. But all previous incarnations and all the years we've lived not in vain, information about them is stored in the karma and has sometimes decisive influence on the destiny. The time, place and conditions of each embodiment are defined by all of our past life. And any our choice between good and evil brings us closer to God or removes from it, increases the power of the devil over us, or decrease it. And for every choice sooner or later we will have to answer.

Here also we should mention that unlike other religions of Zoroastrianism no one promises of eternal torment. In the end will be saved all people, regardless of their weight, as everywhere good will triumph and evil will be finally defeated. And God, the Creator does not need to create it, what's more, the most perfect of creation, suffer eternal torment. God is love, and love is not dependent on anything, too forgiving. However, before salvation, in the

period of the final judgment every man will be forced to pay for their sins, to suffer. The measure of this suffering will correspond to the degree of sin; will be proportionate to the power that each of us has provided over himself forces of evil. During the life of evil can affect a person, can destroy his body, to defile his soul, but to destroy it or make it similar to it is in principle incapable. The divine beginning in us, our spirit is indestructible. That is why in the end, all of creation will be saved, cleaned, restored in its last body and will live forever.

An important place in Zoroastrianism is the doctrine of the trinity of the world and all its parts. There are three forms, three parts of the world:

- the ideal world, disembodied, spiritual — Menog;

- the real-world, embodied, physical — Getig;
- the world, binders of ideal and real worlds and maintain the balance between them — Ritag.

Man, like any other part of the world, also has three main components, respectively, of the spirit, body and soul. The spirit is perfect in man, in his divine potency, his instinctive understanding of the proper world order, true beauty, his conscience. The body is the manifested part of man, his dense body, mind, feelings, emotions, that is what in science is accepted as a real person. The soul is what connects man with God, with the divine in each of us, what makes us each step to commensurate with the ideal, search for the right decision, that is the voice of our conscience.

It is very important to pay attention to that the person is perceived by Zoroastrianism as a whole, complete system, in which the spirit is not opposed to the body, but supplements it. It is fundamentally different from those teachings, which bring only material to the beginning, to the interests of the body, and from those who declare the only true and essence of a man except the spirit. The spirit, the soul is no less real than the body. And the body is not a prison for the spirit and soul, not a vessel of evil, not something alien to man. All three ingredients have a specific function; they all meet their manifestation in the world, created by the Creator. And despite the fact that the body in contrast to the spirit and soul given to us temporarily, despite the fact that it is doomed to die in this life, it does not interfere with the spirit, does not distract us from the spiritual life and helps us to live a full life, to solve the problems for which we are being given this life. The man without a body cannot be considered as perfect, creations, as in this case he is not able to act in the phenomenal world. Therefore, for the Era of distinguish, each of us will receive his last body, which will be immortal.

On another level — the level of actions, external manifestations — the three forms of the world in man correspond to thoughts, words and deeds. Thoughts are the ideal image action, plan of

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action, disembodied ideas. Things are a practical implementation of ideas, the actual embodiment of the thoughts. Words are the link between ideas and their expression, the articulation of a sequence of procedure, means of checking the correctness of the implementation of thinking. That is, every action, every deed, word, thought we affect the world. This important provision of Zoroastrianism raises man to the level of the participant of global processes, but also dramatically increases his responsibility. And every person is evaluated not by itself, not at the whim of some higher power, not by the accepted norms of social life, and to the highest standards — according to the laws of the world, according to the degree of participation in the development and purification of the world or in the desecration and destruction of it. No wonder in Zoroastrianism man is not seen as a servant of God or servant of God, and as the helper of God, who, even in the best of my small ability can make a very real contribution to the struggle between good and evil.

Evil actions are always extremely primitive essentially (though extremely diverse in form). Once the Creator creates something new, the devil immediately generates the destroyer, force of evil, specializing in the desecration and destruction of this new creation. Therefore, every part of the world, his every expression has a corresponding devil, demon, called Zoroastrianism dev or dive. Similarly the three forms of the world are opposed by the three main faces of evil, the three main destructive forces associated with three primary sin of man:

- To the ideal world, the world of Menog, opposes the devil Angra Mainyu, he seeks to desecrate the very idea, to replace its by pseudoidea, to deprive the Creator of the rightful place for him in the center of the universe, to put himself, or some idol, or person, etc. Of course, a complete victory of the devil in the world of Menog impossible, but in some parts of the world, he can very much.

- To the real world, the world Getig, opposes the demoness Aza, destructive physical, embodied world.

- To the world of the binder, the world Ritag, opposes the demoness Drudj, which in any way tends to confuse the true relation of the real and ideal worlds, to sow discord between them.

The next level of the world is the Good Creations, that is, the primary world of the beginning, which were established in the beginning of Creation and which are the basis of everything. Good Creations, there are seven, and each of them has a guardian, a defender from destruction, patron. The patrons of them serves Ahura-Mazda himself and the six Immortals of the Holy archangels (Amesha-Spenta), representing the top level of the hierarchy of light forces. To Good Creations include:

- Fire (or Light) that gives life and energy to all things. His patron — Asha-Vahishta.

- Air (or Sky), organizing communication and interchange in the world. His patron — Kshetra-Varia.

- Water that supports of the harmony of life, the continuity of its flow. its patron — Haurvat.

- Ground, giving the form a solid basis for all the creations that hinder their physical destruction. its patroness — Spenta-Armaiti.

- Plants. Their patron — Amertat.

- Animals. Their patron Vohu-man.

- People (and similar entities). His patron himself Ahura-Mazda.

The first four of the Good creation (fire, air, water and ground) are the names of the elements. However, we should not equate them with the same name with them physical bodies, with our usual natural elements; it's just the easiest, most coarse level of their manifestation. Elements are the fundamental beginning, elements of complex combinations which create the diversity of the world. Element can give rise to one another, pass one another, but their distinctive feature is that each of them contains three other elements.

Unlike them each of the following three Good Creatures (plants, animals and people) contains all four elements: fire beginning, air beginning, water beginning, and ground beginning. Moreover, each of these subsequent three Good Creations and contains the previous one, i.e. animals contain vegetable start, and the most perfect man — both plant and animal beginning. By the way, in this sense, it is really possible to speak about the simplicity and complexity of creation, but in principle any of the Good Creations to the end of a mystery how, indeed, any other part of the world).

Another hallmark of the last three Good Creations is their level of freedom: the plants have the least freedom of choice, the animals have freedom of choice more, but man is given the maximum freedom. Respectively the least ability to develop (in this embodiment) are plants, animals she is noticeably higher, and the highest given to man. However, to be defiled, to embark on the path of service to evil, to achieve on this path of success more likely it is the person, the fewer animals and in plants.

The strategy of evil against the Good Creatures remains uncomplicated. For each one it generates his special demon-destroyer, the Defiler. Generally, demons (Devas, daives) exists as long as there are all sorts of creatures, their various parts and symptoms. But those that defile seven Good Creations — these are the main Supreme demons (called mahadaivas). Each of them seeks to destroy the primal perfection of the relevant Good Creations, using an army of subordinate smaller demons. Mahadaivas can be compared with those diseases that affect the major systems of the human body: nervous, circulatory, musculoskeletal, etc., and their subordinate demons

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— with the disorders of individual organs, cells and subcellular structures of these systems. The task of Mahadaivas is to add an imbalance in the ratio of Good Works, to upset the harmony between them and disrupt their relationship in order to simplify the demons (the dive) further destruction.

The principle of medium and encouraged to adhere to the original ideal, to keep the primary order, the beauty of the world, which was established by the Creator. It does not seek to narrow the diversity of the world, to neutralize the differences between people, bringing them all to a dull uniformity, or to make our life dull and dreary as some believe. No, the rejection of extremes, from excesses, from vacillation from side to side makes us more resistant to the machinations of evil forces, narrows their field of activity, giving us the

opportunity to develop their individuality, their creativity.

The principle of the Golden medium, on the one hand, helps to preserve what exists, not to lose previously accumulated, and on the other hand, warns against that which hinders progress on the chosen path, urging people not to stray into the path of destruction of ourselves and the world. For example, are equally valid unbelief and fanaticism, excessive activity and excessive passivity, thoughtless impulsivity and sluggish hesitation, screaming luxury and enslaving poverty, deadly stagnation and bloody revolution, ugly depletion and no less ugly obesity, isolation on the past and focus on the future, self-satisfied stupidity and feverish obsession with gaining knowledge, cold insensitivity and flaming folly, egotism and abasement, drought and flood.

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SECTION 8. Architecture and construction.

USE OF SEMI FIXED COMPOSITE SURFACES AT GEORGIAN

Abstract: In the work is discussed the recommendation of implantation and using of semi fixed composite surface in the itinerary infrastructure of Georgia. Are discussed positive and negative sides of the surfaces of such type, the technologies and peculiarities of their arrangement. In the work are compared physic-mechanical peculiarities of semi fixed composite surface and compared with the practical asphalt concrete arranged surface.

Key words: semi fixed composite surface, asphalt concrete, concrete surface.

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УСТРОЙСТВО ПОЛУЖЕСТКОГО КОМПОЗИЦИОННОГО ПОКРЫТИЯ В ГРУЗИИ

Аннотация: В статье был проведен обзор дорожной инфраструктуры Грузии, развитие и использование полужестких композиционных покрытий. Также был проведен обзор плюсов и минусов такого типа покрытий, технология укладки и физико-механические особенности, в статье показаны физико-механические свойства традиционных асфальтобетонов и полужестких композиционных покрытий.

Ключевые слова: полужесткие композиционные покрытия, асфальтобетон, цементобетонная покрытие.

Развитие автомобильной дорожной сети в Грузии вошло в активную фазу. Проводится реабилитация существующих автомобильных дорог, а также укладываются новые автомагистрали.

Мы считаем целесообразным во время реабилитации дорог низкой категории использовать полужесткий композитный настил.

Использование такого типа покрытия на дорогах низшей категории позволит снизить затраты. Это очень важно для экономического развития страны. Укладывание дорог таким покрытием требует низкие энергетические затраты, что будет направлено на снижение вредных воздействия на окружающую среду. Полужесткое композитное покрытие эффективно в горной местности, что является идеальным вариантом в нашем случае.

Структура асфальтобетона формируется на всех этапах технологического процесса. Этапы для каждой разновидности асфальтобетонной смеси имеют свои особенности, что отражается в конкретном Технологическом регламенте.

Регламент содержит требования к исходным материалам и продукции, результаты оценки их качества на соответствие требуемым показателям, подобранную рецептуру смеси, перечень необходимой техники и оборудования, описание технологического процесса и его параметры, экономические показатели и др.

Технология устройства полужесткого композиционного покрытия из черного щебня и цемент песчаного раствора предопределяется конструктивной особенностью жесткой прослойки и покрытия в целом.

Для таких покрытий используют в основном традиционные дорожные машины и агрегаты. Однако в зависимости от конкретных условий и конструктивных особенностей покрытий не исключена необходимость конструирования специальных узлов механизмов для приспособления существующих дорожных машин и агрегатов к технологическим процессам пропитки слоя черного щебня цемент песчаным раствором или введения структурных армирующих элементов в тело нежесткого



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покрытия. Все зависит от творческого подхода; строителя к решению вопроса.

При пропитке слоя черного щебня сверху (прямая пропитка) вдавливание цемент песчаного раствора в пустоты (в поры) слоя черного щебня осуществляют пневмокатками или виброкатками. Для этих целей можно использовать также площадочные вибраторы. При выборе катков следует учесть, что цемент песчаный раствор легко прилипает к барабанам гладко вальцевых катков, затрудняя процесс вдавливания раствора в слой черного щебня.

Для обеспечения нормального процесса пропитки в раствор следует вводить супер пластификатор. Контрольное определение глубины пропитки на месте позволяет непосредственно на дороге корректировать норму расхода и консистенцию (подвижность) раствора в зависимости от размера образовавшихся при уплотнении слоя черного щебня пустот (пор), вида пластификатора в средства вдавливания раствора в слой черного щебня.

Число проходов катка составляет примерно 4—5 по одному следу.

Процесс вдавливания раствора в слой черного щебня считается законченным, когда черный щебень выступает под поверхностью слоя цемент песчаного раствора на 3—4 мм. Выступающие грани щебня обеспечивают определенную шероховатость жесткого слоя при использовании его в качестве верхнего или, контактируя с горячей асфальтобетонной смесью, увеличивают сцепление с верхним слоем при использовании жесткой прослойки в качестве нижнего слоя.

Обеспечение нормативного количества разливаемого цемент песчаного раствора является необходимым условием, так как при избытке может образоваться сплошной (непрерывный) слой из цемент песчаного раствора над слоем черного щебня, что является дефектом и отступлением от принципа устройства полужесткого покрытия.

При пропитке раствором слоя черного щебня снизу (обратной пропитке) технология несколько упрощается, так как давление на цемент песчаный раствор передается непосредственно через слой черного щебня, подлежащего пропитке.

Для укатки слоя черного щебня можно использовать все виды катков, применяемых для укатки дорожных покрытий. Следует отметить, что при обратной пропитке качество жесткой прослойки несколько снижается, и такой способ преимущественно применим при использовании жесткой прослойки в качестве нижнего слоя, лежащего при этом на плотном основании.

В летнее время для обеспечения нормального тепло-влажностного режима твердения цемента, слой горячего черного щебня поливают водой до (при прямой пропитке) и после (при обратной пропитке) пропитки раствором в количестве 5—10 л. на кв.м. покрытия с использованием традиционных поливочных машин.

Полный технологический цикл устройства полужесткого композиционного покрытия при прямой пропитке состоит из следующих операций:

Приготовление черного щебня на центральных базах и доставка его в горячем состоянии (130—150°C) на дорогу автосамосвалами;

Устройство слоя из черного щебня по существующей технологии.

Специфика настоящей технологии заключается только в том, что количество прохода катка по одному следу ограничивается из условия образования крупнопористого слоя черного щебня, легко пропитываемого цемент песчаный раствором;

Приготовление цемент песчаного раствора (при необходимости с добавками пластификатора и полимера) на месте в передвижных растворомешалках или на центральных базах и доставка на дорогу авто бетоновозами, автосамосвалами или специально оборудованными транспортными средствами;

Выгрузка цемент песчаного раствора непосредственно на слой черного щебня и разравнивание его самоходным укладчиком дорожно-строительных материалов (смесей), автогрейдером. Количество раствора составляет 3,5—4,5 л на кв.м. и на 1 см. глубины пропитки покрытия;

Вдавливание цемент песчаного раствора до начала схватывания цемента в крупнопористый слой черного щебня пневмокатками или виброкатками.

Разлив битумной эмульсии в количестве 0,4 л. на 1 кв.м. покрытия автогудронатором по готовому слою' черного щебня, пропитанного цемент песчаным раствором, при использовании его в качестве верхнего слоя и укладка верхнего слоя из мелкозернистой асфальтобетонной смеси асфальт укладчиком без перерыва, при использовании его в качестве нижнего слоя, с последующим уплотнением ее катками;

Если жесткая прослойка служит верхним слоем основания, сразу же после пропитки слоя черного щебня цемент песчаным раствором укладывают нижний слой асфальтобетона. При этом верхний слой асфальтобетона может быть уложен с перерывом в несколько дней, но лучше не задерживать больше одних суток.

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Спустя 24 часа выдержки готовое покрытие можно передавать в эксплуатацию.

При устройстве покрытия способом обратной пропитки технологическая последовательность несколько меняется: вначале разравнивают цемент песчаный раствор по готовому основанию, а затем укладывают слой черного щебня. Его распределяют по свежееуложенному слою раствора обычными распределителями щебня или асфальт укладчиком. Укатку производят пневмокатами, виброкатами или, при их отсутствии,

обыкновенными жестковальцовыми катками, до полного втапливания щебня в слой цемент песчаного раствора и до появления на поверхности раствора. Сразу же по окончании пропитки устраивают верхний слой асфальтобетонного покрытия.

При двухсторонней, при обратной и потом прямой пропитке более толстых слоев черного щебня обе операции можно выполнять одновременно или с определенным перерывом между ними.

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SECTION 26. Medicine.

ON ONE METHOD OF SCALE EXAMINATIONS OF THYROID GLAND CONDITION

Abstract: On the base of brief review of domestic and foreign papers, devoted to the methods of express diagnostics of thyroid gland pathologies, a new version of reflex meter is suggested. The data of scale examinations of thyroid gland condition of students in the age from 16 till 18 years are also presented.

Key words: thyroid gland, reflex meter, screening test.

Language: English

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Introduction

There is a great need for a simple test of thyroid function state which can be used in clinical practice and in peripheral hospitals where other methods are not available. Tendon-reflex timing which gives an immediate result is the method which has been used increasingly in 70-s - 90-s of past century as an index of thyroid function [1-3]. In general, reflex times correlate well with hormone estimations.

Discussion of the method

It is generally accepted that the tendon reflexes are shortened in the majority of patients with hyperthyroidism and prolonged in the case of

hypothyroidism. Chaney was the first who recorded the Achilles tendon reflex and proved what had previously detected clinically [4].

Since then various techniques were developed for the ankle-jerk timing. One of them was the method used by Lawson [5, 6], in which the ankle-jerk is timed with the use of a magnet attached to the sole, movement of which generates current in an inductive coil recording directly on an electrocardiograph. Before testing starts a horseshoe magnet is strapped to the sole of the patient foot under the arch.



Figure 1 - Ankle-jerk timing.

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The gist of the method is following. The subject kneeling on a chair, a horseshoe magnet is strapped to the sole of the foot under the arch at 2 cm. distant, twin induction coils are placed and connected to two leads of a portable electrocardiograph (Fig. 1).

Duration of a tendon reflex is calculated indirectly dividing the length of the diagram

projection on horizon axe by the paper speed of electrocardiograph.

This apparatus are widely used in clinical practice because of its simplicity and convenience [7 - 14]. A diagrammatic representation of typical tracing is shown on Figures 2, 3. [12].

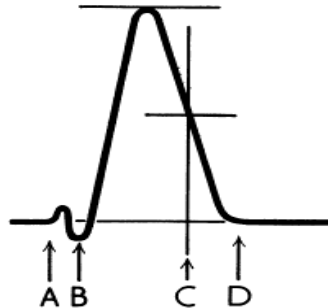


Figure 2 - Diagrammatic representation of a typical tracing.

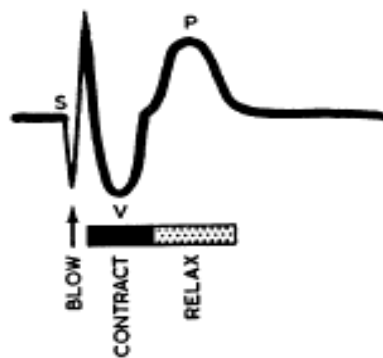


Figure 3 - Diagrammatic representation of the ankle-jerk, showing the contraction and relaxation phases.

Discussion of the tracings

The obtained tracing consists of initial part due to the hammer striking the tendon, beginning at point S, followed by a slower downward deflection caused by muscle contraction, and a final upward deflection representing relaxation. Then follows the valley designed by point V and the peak P.

Initially the distances SP, SD (D being the point where the line VP crosses the isoelectric line), and VP were measured. However, D is variable and often difficult to identify. The interval VP was the best in determining patients with thyroid disease from the control group. The VP interval is that between maximal rate of contraction and maximal rate of relaxation is an index characterizing the muscle response.

Although many authors have confirmed Chaney's original findings, the value of measuring the Achilles tendon reflex as an index of thyroid function is still in doubt.

The method raised some conflict of opinions about the value of this test because of poor

reproducibility and accuracy of times obtained. Most contradictions arise in the question of interpretation of complicated diagram and determining the real time of tendon reflex duration. This is a source of errors and divergence of data obtained by different authors. Some of them measure the interval between maximal rate of contraction and maximal rate of relaxation. Others measure the time from the blow on the tendon to the point of half-relaxation, including the latent period.

High measuring error and significant spread of results are also due to the reflex meter construction, when Achilles tendon reflex time is measured indirectly using the electrocardiograph. Therefore, this measurement is interfered with mechanical artifacts caused by hammer strike of the tendon. This reduces the reliability of the results [15].

Suggested method

The goal of this work was to develop a direct method for measuring the reflex time of the knee jerk

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in patients with thyroid pathologies, its clinical testing.

It is known that thyroid disorders bring change of all reaction times, including a knee joint reflex, which is a representative physiological parameter [20 - 23]. However, because of absence of corresponding instruments, the time of knee joint reflex is tested only qualitatively [16 - 19].

In present work, a direct method and device for high-accuracy measurement of the reflex time of the knee jerk in norm and pathology is suggested.

The method is based on the use of a reflex meter consisting of three basic elements: an electronic stopwatch timer and devices for remote switch-on and switch-off of the timer. The electronic stopwatch timer provides the time measuring with an error not more than 1 millisecond. On fig. 4 the scheme of

measuring is shown. Here 1 – the electronic stopwatch timer; 2, 3 – connecting wires; 4 – remote switch on device, 5 – remote switch-off device. The switch on device is a contact knob installed in neurological hammer. At the moment of hammer blow the knob switches the timer.

The switch off device is the same kind of knob installed to a toe-cap attachment. Before the test starts the toecap attachment points to such position so that the knob plants against barrier, for example to the side of the table.

After the blow due to the reflex movement the foot pushes the knob which stops the timer. The timer measures the reflex duration, which allows the thyroid gland state estimation.

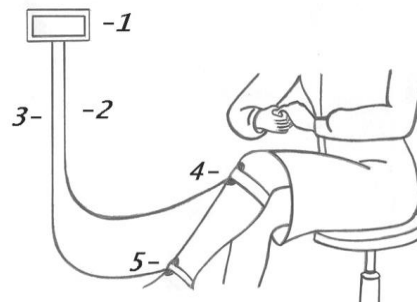


Figure 4 - Knee-jerk timing.

After the blow due to the reflex movement the foot pushes the knob which stops the timer. The

timer measures the reflex duration, which allows the thyroid gland state estimation.



Figure 5 - The photo of knee-jerk reflex meter.

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Figure 6 - The examination test photo.

On figure 5 the photo of knee-jerk reflex meter is shown. Also shown is the examination test photo (fig. 6).

The data of scale examinations of thyroid gland condition of students in the age from 16 till 18 years are presented in the graph (fig. 7). For carrying out the investigations, the methods of express diagnostics, developed by authors of present paper were used. The examinations were carried out on the group of 101 people.

After statistical processing of measurements data the randomization with the use of the criteria, established during the clinical tests of developed

devices, was carried out. The obtained data are presented in the form of histograms. As a result of the investigations the circle of students, which according to the received data are possible to assume the existence of hypo function of a thyroid gland, was established. The part of such persons among those, who were examined, makes about 17 %.

Hyperthyroid signs were established among insignificant part of examined persons. The part of them doesn't exceed 8 %. Students with abnormal reflex times were recommended for hormone testing with consultation of the endocrinologist.

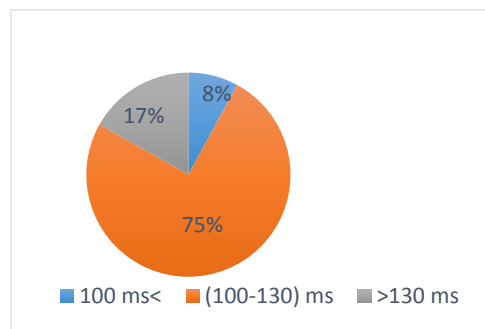


Figure 7 - The diagram of the data of scale examinations of thyroid gland condition of students.

Conclusion

A simple, cheap, and portable method is described for the measurement of the knee-reflex time. It is shown to be a reliable diagnostic aid in thyroid dysfunction and particularly in cases where clinical difficulty is present. The measurement of the knee-jerk time is a reliable test of thyroid function in pregnancy.

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**SECTION 21. Pedagogy. Psychology. Innovations
in the field of education.**

CONTENT AND STRUCTURE OF ELECTRONIC TEXTBOOK OF RUSSIAN AS A FOREIGN LANGUAGE

Abstract: *The paper considers the features of selecting the teaching illustrative material for the practical part of a multimedia textbook on Russian as a foreign language, and describes the peculiarities of compiling a set of exercises on the basis of the Russian National Corpus. The author analysed the difficulties caused by working with the National Corpus of the Russian Language for educational purposes and problems emerged in the process of working on a project aimed at creating an electronic textbook "The Russian verb. Word formation".*

Key words: RNC, electronic textbook, Russian as a foreign language, lexical and grammatical exercises, distance learning.

Language: English

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Introduction

The form of distance education has existed since the late 19th century, and with the advent of Internet technologies available it is firmly established in our lives.

Electronic course materials are becoming more popular than printed, and under certain conditions may not only improve the efficiency of the educational process, but also turn it into a new format. In recent years there has been an active penetration of information technologies in very traditional, well-established fields of education, one of which is teaching Russian language, in particular, Russian as a foreign language (hereinafter – RAF).

The quality of e-learning in general and e-books in particular, depends on the technologies used, because the complexity of the electronic textbook, not only impedes the perception of educational material, but also cause a certain rejection by the student. In the development of an electronic textbook on the basis of the Russian National Corpus (hereinafter - the RNC) not paid electronic publishing was preliminary analyzed, but existing network grammar manuals, available for free use.

The most interesting on-line tutorials are available at the Moscow Financial University, People's Friendship University [1], an unknown developer [5], of The Lexiteria Corporation [10].

Because the developers' plans included the use of the RNC material and software corresponding to specific linguistic requirements, as a result we had to make a pilot fragment of a textbook on RAF, aimed at the advanced level of training, work with which is free and remote.

The content of the textbook

As a fragment of the textbook the theme "The Russian verb. Prefixal word-formation" was chosen, as one of the most difficult for the assimilation by foreign students. It is assumed that in the future the electronic textbook will be supplemented with materials on other parts of speech. However, at this stage it was important to put a really achievable goal and create a product balanced from the point of view of linguistics and programming. Address to the RNC materials allowed us to avoid repetitive examples in the exercises and really focus on the living, actual word usage. At the same time, the richness of lexical composition of RNC determines the highest level of exercise difficulty, after the creation of which additional examination of linguistic data and stylistic differentiation of the material is required.

The Russian Corpus is characterized by deep, diverse, and constantly improving marking (metatext, morphological, syntactic, semantic and accent), it greatly simplified the work of the compilers in the



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selection of illustrative material. The main tasks in the preparation of textbooks included the selection of RNC examples to illustrate the rules and make up exercises. The complexity of any textbooks creation related to the exhausting search of examples, requiring considerable time costs and to the limited imagination of the author in selection of exercises.

For selection of examples in the theoretical part of the textbook it is appropriate to appeal to the RNC custom search. The portal provides a detailed instruction "How to use the corpus", but the search page is intuitively understandable and comes with handy pop-up prompts, and the search is organized logically enough, so the choice of examples with specific word forms did not cause difficulties.

For educational purposes the feature of giving results in Excel is useful, you can work with the illustrative material for one linguistic phenomenon, containing about 2,000 examples. The more well-constructed and limited request is, the less side information is contained in the received examples. However, in the process of working with the RNC we had to deal with some difficulties.

The Corpus provides the ability to search for several words, and semantic-grammatical, so you can get a clear enough limited request. The apparent advantage of the request for RNC is the ability to change the settings of the delivery of examples, although with every new request to the search page, these settings are not saved and they have to be re-entered, as RNC does not provide saving of search criteria by default.

The required examples are not always displayed with accents, although there was the possibility in search settings. Because the accent in the Russian language is non-fixed (as opposed to, for example, French or Czech languages), this feature in a textbook for foreign students is obligatory.

As for the filtering of examples in Excel, then, as it turned out, the words are only in a certain order in which the initial text search is performed (user changes of the settings are not fully taken into account), namely, the search system finds some text and selects from it all possible variants that match the specified criteria. Then it moves to the next, and analogically presents the examples. In this scheme, there is undoubtedly a positive thing: if the subject matter of the text from which the example was taken, does not fit initially, you can skip a number of examples of the same text and move to the next. But there can be many such texts, and no ability to specify the preferred, and sometimes even after consideration of all the examples that are saved in Excel, 30 verbs (needed to accomplish the original problem) were not gained. We had to think out the possible cases by analogy, limit search parameters, and view examples of specific verbs. A major drawback of RNC was a significant slowing down the server, directly proportional to the amount of

simultaneously set required categories of verb (mood, tense, transitivity / intransitivity, reflexivity, the presence of semantic features).

Despite these difficulties, the search for examples for the theoretical part of the electronic textbook based on the RNC can solve two major problems faced by developers of teaching materials: first, the possibility of adjusting the search on grammatical and semantic criteria, and the subsequent issuance of the results in Excel format allows to automatically obtain a sufficient number of examples, from which we can select the required manually. Secondly, the texts that are accessed by RNC, and really modern and only the developers' sense of proportion and taste is a criterion for the selection of the material.

If the main purpose of the selection of examples for the rules is to demonstrate the use of the verb in the required situation, in the preparation of exercises you should look for examples that are appropriate to a particular rule, and bear in mind the possibility of restoring a verb or its part (for example, the prefix) in the context.

One of the major advantages is the possibility of making the exercises, which are based on the marked video clips from Soviet and Russian feature films (RNC multimedial subcorpus), which are available on video-hosting "Yandex Video". Fragments, close to living communication, and not read by one speaker, transmitting at the same time the wealth of intonational structures of the Russian language in a professional performance - a real godsend for compilers of textbooks. Multimedia corpus permits requests providing us with sufficient material for the exercises. Each video clip is provided with decoding a replica with metamarking and marked accents. Implementation of this work by hand, without reference to the Corpus materials, is not possible. Most of the time was occupied by listening to each movie, because it was necessary to assess the overall sound quality, the breadth of the context, the presence of background noise in the replica or the dialogue.

The negative moment in the sentences selected with the help of the RNC and received in Excel-format, is that the source of many of the texts are online forums where users communicate in spoken language or jargon, often incorrectly and illiterately (the words are not always used correctly for a particular context, there are mistakes in spelling). Content aspect of this kind of examples also sometimes wears a primitive character. These drawbacks suggest that for the use in the exercises RNC examples should be thoroughly pre-filtering.

The developers' focusing on only one, rather narrow aspect of study of the verb in the Russian language, has played a positive role. The Corpus materials are so varied and diverse (for example, we can mention a variety of subcorpus: accentologic,

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news, dialects, multimedia, training, parallel, poetic, syntax, oral) that only a clear phased work allows a detailed investigation of all its features and use them optimally in developments. In the long term - exercises not only in morphology but also in syntax, stylistics, lexicology, historical morphology and other aspects of language. The plans of the developers of the project also include compilation of exercises with more extensive use of multimedia RNC subcorpus.

The above features of work with using RNC materials relate only to the content, linguistic aspects of the project, difficulties and discoveries, faced by the members of the project - programmers, whose main task was to create a structure of an electronic textbook on RAF, are no less fascinating and important.

The structure of the textbook

To link the RAF materials we use the technology for creating an electronic textbook that supports the format of the SCORM (Sharable Content Object Reference Model) to implement it in any modern system of LMS (Learning Management System). A feature of this textbook is the ability to view real-time actual examples from the RNC, and a tooltip containing the translation of words into English, the primary form of the word and the corresponding grammatical information. The theoretical part of the textbook is filled with materials pre-selected from the RNC. The main component of the theoretical part of the textbook is the rules for the use of prefixes to the verb, and a number of examples that are available after clicking the appropriate button.

Russian Additional element that improves understanding of the use of examples in the textbook is a tooltip containing the translations and grammatical information of each word. The data are generated by server software and transmitted to the user's browser, where there is only a drawing of a pop-up window with the acquired information. Obtaining the necessary information is produced on a particular signal of a student or, in terms of the program, during a certain event in the user's browser.

The main problem in the selection of examples was the lack of stress in most words. In the end, the placement of stress in words was made in all the examples. Here we consider several ways of setting an accent mark. Accent mark - a sign of non-alphabetic spelling of Russian writing, in other terms - one of the superlinear diacritical marks, is placed above the vowel corresponding to the stressed sound.

The practical part of the electronic textbook is called "The use of prefixed verbs in speech. Exercises. "To this section we added a variety of exercises on a single / multiple choice, filling gaps,

specially designed video exercises, for which we selected the most relevant video clips from the multimedia RNC subcorpus posted on the video-hosting "Yandex Video", and multimedia elements of HTML-text are integrated into the exercises.

The exercises are used for working out the studied rules of the use of prefixes that have been learned in the theoretical part of the textbook, reinforcement of knowledge and expanding a student's passive vocabulary. Also final control tests were added to the book, you can use them to check the quality of learning material.

In the theoretical part of the electronic textbook, in addition to the possibility to analyze the effect of rules on the sentences selected by the compiler and written in the book, the opportunity was organized to address RNC by pressing the button and pick out "live" examples. These "live" sentences are extracted in real time from the constantly renewing corpus and, therefore, always include various and actual examples of use of words. The accuracy of the semantic meaning of an example of the use of a prefix depends on the ability of a linguist - compiler of the textbook, to formulate a query to search for the RNC as narrowly as possible, to cut off possible getting of sentences in which the search word is used in another meaning.

We illustrate the mechanism described by a query that extracts examples of the use of verbs with the prefix "v" and indicating the orientation inside (*vbit'*, *votknut'*, *vnesti'*, *votknut'*). To illustrate the rules we should find verbs that govern accusative with the preposition "v" (*v komnatu*). To prevent getting of participles and verbs in the subjunctive and the imperative, in the lexical-grammatical search restriction by grammatical features is given: verb - indicative mood. The step of searching a preposition from the verb is set (1-2 words), as often a direct object is after the verb before the preposition (*votknul ego/malchika v komnatu*).

Content of request was developed and optimized so that we could always get the answer, the most relevant to the given section of the textbook. At the same time a small percentage of examples, that got into the textbook mistakenly, is possible. This is the downside of using a "live" search of examples in the Russian National Corpus. We decided to level this drawback with the help of a multipage view of search results in multiple requests to the server.

These ideas are combined and added to the page template, and then the created page is sent to the client's computer.

Conclusion

The subject of development of electronic textbooks is now, of course, important, since with the



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advent of distance education in electronic form, its active implementation to the universities and the corporate sector, new approaches to provide knowledge, fast and cheap, are required. Analysis of existing electronic textbooks of Russian as a foreign language showed that they are designed for elementary and basic level of language learning and, accordingly, contain low-level exercises. Identified gap in the basis of textbooks on RAF presented on the Internet and on digital media (namely, the lack of exercises on grammar and word formation for students of second and third certification level of language), convinced the developers of the textbook that a need has formed for using quality linguistic manuals that are devoid of drawbacks typical for this type of product.

The approach to the content side of the textbook

and the developed technology can be useful for creating an electronic textbook for any foreign language. Many of the world's languages have marked national corpuses, the material of which can be used for educational purposes. The time required for selection and sorting of examples, is significantly reduced when referring to the corpuses, and the relevance of examples may be given initially, by limiting the time frame of the search. A large volume of corpus (for example, the RNC has more than 300 million words) allows you to create manuals on syntax, stylistic differentiation of speech, use of certain language constructs.

The use of deeply marked-up linguistic corpus, rich in all kinds of texts of different genres, helps to make the study of linguistic phenomena and the use of words more understandable to the student.

Preprint

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<http://www.hse.ru/data/2012/10/03/1244581498/06HUM2012.pdf>

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IMPULS CURRENTS IN THE REHABILITATION OF PATIENTS WITH ENT PATHOLOGY

Abstract: The study of the problem of inflammatory diseases of the upper respiratory tract relevant in connection with the steady growth of their disease and the lack of clear criteria on many issues of diagnosis and treatment. The paper presents an analysis of complex treatment, including fluctuating currents in patients with acute bacterial rhinosinusitis.

Key words: acute sinusitis, fluctuating currents, transcapillary circulation of the brain.

Language: Russian

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ИМПУЛЬСНЫЕ ТОКИ В МЕДИЦИНСКОЙ РЕАБИЛИТАЦИИ БОЛЬНЫХ С ЛОР-ПАТОЛОГИЕЙ

Аннотация: Изучение проблемы воспалительных заболеваний верхних дыхательных путей актуальна в связи с неуклонным ростом их заболеваемости и отсутствием четких критериев по многим вопросам диагностики и лечения. В статье представлен анализ комплексного лечения, в том числе флюктуирующих токов у больных с острым бактериальным риносинуситом.

Ключевые слова: острый синусит, флюктуирующие токи, транскапиллярный обмен, мозг.

Актуальность. Изучение проблемы риносинусита актуально в связи с неуклонным ростом заболеваемости и отсутствием четких критериев при его диагностике и лечении. Воспалительные заболевания носа и

околоносовых пазух являются наиболее распространенными среди заболеваний верхних дыхательных путей [1, с. 91; 2, с. 1].

По имеющимся данным, в России острый риносинусит ежегодно переносят до 10 млн.



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человек [3, с. 13-14; с. 4, с. 64; 5, с. 239]. При этом основными принципами лечения таких больных являются ликвидация инфекции, восстановление дренажной функции соустьев оклоносовых пазух, предупреждение перехода воспалительного процесса в хроническую форму, уменьшение длительности заболевания, предотвращение осложнений. С этой целью традиционно используются пункции верхнечелюстных пазух, а также комплексное лечение, включающее применение различных лекарственных средств и физических факторов [6, с. 344-345; 7, с. 419-420; 8, с. 36-37; 9, с. 30-31; 10, с. 165-166].

Целью данного исследования явилась разработка комплексного метода лечения больных с острым гнойным верхнечелюстным синуситом на основе современных методов консервативного воздействия с использованием флюктуирующих токов.

Предмет и методы. Наблюдались 125 больных, в возрасте $36,7 \pm 2,7$ лет, с острым гнойным верхнечелюстным синуситом. При этом все больные были разделены на две группы: 1-я группа (контрольная, $n=30$ человек) и 2-я группа (основная, $n=95$ человек).

Лечение проводилось в два этапа. На первом этапе больные получали стандартную лекарственную терапию и лечебно-диагностические пункции. На втором этапе больные в 1-й группе получали только поддерживающую лекарственную терапию, а больные во 2-й группе дополнительно получали комплексное лечение, включающее флюктуирующие токи двуполярной симметричной формы, низкого напряжения и малой силы, частотой 22 кГц и плотностью тока до 1 мА/см^2 .

Лечение контролировалось клинико-лабораторными методами исследования, а также риноскопией, рентгенологическими методами и др. При этом цитологическое исследование мазков из полости носа проводилось взятием носового секрета по стандартной методике, с последующим исследованием их в световом микроскопе ($\times 100$ и $\times 1000$). Преобладание в мазке нейтрофильных лейкоцитов расценивалось нами как проявление воспаления [11,79]. Дополнительно проводилась реоэнцефалография (РЭГ) сосудов головного мозга (во фронтально-мастоидальном отведении) на аппаратно-программном комплексе «Реодин-504». Изучались многие показатели, в том числе, показатель транскапиллярного обмена головного мозга (F, норма $0,14 \pm 0,02 \text{ Ом/с}$), при этом межполушарная асимметрия по показателю F в норме составляет не более 15% в пользу левого полушария (для правой).

Анализ статистических данных проводился с использованием текстового редактора Microsoft

Office Word 2010, табличного редактора Microsoft Office Excel 2010 и статистических пакетов прикладных программ Statistica 10.0. Также проводился регрессионный анализ, с использованием метода наименьших квадратов, сущность которого заключается в отыскании параметров модели тренда, минимизирующих ее отклонение от значений исходного временного ряда, где n – число наблюдений, R^2 – величина достоверности аппроксимации. Адекватность полученной статистической модели проверялось по F-критерию и t-критерию Стьюдента, при этом $p < 0,05$ – достоверность изменений между показателями у больных до лечения и нормой; $p < 0,05^*$ – достоверность изменений между показателями у больных до и после лечения.

Результаты и их обсуждение. После второго этапа лечения у 81,0% больных во 2-й группе при риноскопии гиперемия практически не отмечалась, а количество патологического секрета в полости носа носило слизистый характер, а в 5,3% случаев отделяемого в полости носа выявлено не было. У 86,3% данных больных благодаря обезболивающему действию флюктуоризации и прекращению потока патологических импульсов с периферии уменьшился болевой синдром в области лица и головы, который, по мнению некоторых исследователей, является вторичным по отношению к данной патологии [12, 79-80]. При этом в эти же сроки 40,0% больных в 1-й группе пациентов жаловались на выраженную лицевую и головную боль разной степени выраженности, что подтверждалось и при пальпации.

При изучении рентгенологической картины через 1 месяц после второго этапа комплексного лечения у 85,3% пациентов во 2-й группе наблюдалась регрессия воспаления, а у 36,6% больных в 1-й группе о продолжавшемся воспалении свидетельствовало утолщение слизистой оболочки разной степени выраженности.

До лечения у всех данных больных в цитogramмах отделяемого из носа наблюдались нейтрофильные лейкоциты и клетки плоского эпителия, расположенные пластами, а также клетки цилиндрического эпителия в различных стадиях дегенерации. При этом после второго этапа комплексного лечения у 83,2% больных во 2-й группе нейтрофильные лейкоциты определялись в единичных случаях, а у 63,3% больных в 1-й группе нейтрофильные лейкоциты все еще были многочисленными, а клетки плоского были единичными в обеих группах. Дегенеративные же изменения в клетках цилиндрического эпителия у больных во 2-й группе встречались в единичных случаях, а у большей части больных в 1-й группе отмечалась, по-прежнему, их выраженная дегенерация.

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В системе кровообращения микроциркуляторное русло является связующим звеном между артериальными и венозными сосудами и зависит от большого числа внутренних и внешних факторов, поэтому важным было изучение в данном исследовании микроциркуляторного русла головного мозга у данных больных [13, 33-35]. При этом для всех больных в 1-й и 2-й группах до начала лечения была характерна дисфункция трансапиллярного обмена области головного мозга, что могло свидетельствовать о нарушении у них компенсаторно-восстановительных процессов.

Общепризнанным считается, что адаптивное поведение биологических объектов связано также с функциональной межполушарной асимметрией головного мозга. Многие исследователи используют показатель межполушарных отношений для оценки функциональных состояний организма, особенно для тех, которые связаны со стрессом. Считается, что изменение межполушарных отношений вследствие различной подкорковой активации, которая характерна для данной патологии, влечет за собой даже смену установившихся физиологических механизмов таких, как биохимические, иммунологические и др. Регуляция межполушарных отношений открывает возможности управления функциональным состоянием организма [14, 4-5].

Возможно, доминирующим фактором, влияющим на характеристики динамической асимметрии показателя F у наших больных являлось наличие патологии в области гайморовых пазух, что привело к целостной реакции их организма в виде изменения функционального состояния многих систем.

До начала лечения в нашем исследовании отмечалась асимметрия показателя трансапиллярного обмена F в пользу правого полушария у больных в 1-й и 2-й группах соответственно на 33,5% и 33,6%. При этом до начала лечения у больных во 2-й группе, получавших комплексное лечение, показатель F соответствовал в левом полушарии 0,06 Ом/с ($p < 0,05$), а в правом – 0,08 Ом/с ($p < 0,05$). После курса лечения у больных во 2-й группе показатель F в левом и правом полушарии соответствовал: после курса лечения – 0,11±0,03 Ом/с и 0,091±0,03 Ом/с ($p < 0,05$; $p < 0,05^*$); через 1

месяц – 0,11±0,03 Ом/с и 0,092±0,03 Ом/с ($p < 0,05$; $p < 0,05^*$); через 3 месяца – 0,10±0,01 Ом/с ($p < 0,05$; $p < 0,05^*$) и 0,081±0,01 Ом/с; через 6 месяцев – 0,10±0,01 Ом/с ($p < 0,05$; $p < 0,05^*$) и 0,079±0,01 Ом/с; через 9 месяцев – 0,090±0,01 Ом/с ($p < 0,05$; $p < 0,05^*$) и 0,068±0,01 Ом/с; через 12 месяцев показатели стали ухудшаться, но, все же, у больных во 2-й группе не вернулись к своим исходным значениям – 0,089±0,01 Ом/с ($p < 0,05$; $p < 0,05^*$) и 0,066±0,01 Ом/с. При этом асимметрия F между левым и правым полушарием начала приближаться к норме и составляла в эти же сроки у больных в 1-й и 2-й группах соответственно – 18,1%; 16,9%; 19,2%; 21,3%; 24,5% и 25,6%.

Регрессионный анализ показал, что у больных во 2-й группе после второго этапа комплексного лечения наблюдалась тенденция степенных трендов показателя F левого и правого полушария в стремлении к своим нормальным значениям, что достоверно привело к уменьшению межполушарной асимметрии ($R^2=0,7628$ и $R^2=0,7439$, соответственно, $p < 0,05$). При этом у больных во 2-й группе можно было дать для этого параметра положительный прогноз на 2 будущих периода, по сравнению с таковым у больных в 1-й группе ($R^2=0,8324$ и $R^2=0,5112$, соответственно, $p < 0,05$).

Через 12 месяцев после второго этапа комплексного лечения у 91,6% больных во 2-й группе отмечено выздоровление, а рецидив заболевания через 8-9 месяцев наступил лишь у 3,2%. В те же сроки полное выздоровление наблюдалось у 44,7% больных в 1-й группе, а обострение заболевания наступило у 13,3% больных уже через 5-6 месяцев.

Заключение. Предложенный двухэтапный комплексный подход при лечении больных во 2-й группе с острым гнойным верхнечелюстным синуситом, включающий использование флюктуирующих токов, сопровождался улучшением трансапиллярного обмена головного мозга, а также цитологических, рентгенологических и эндоскопических показателей в более ранние сроки, что сопровождалось стойким клиническим улучшением и положительными отдаленными результатами лечения, по сравнению с больными в 1-й группе.

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**SECTION 31. Economic research, finance,
innovation, risk management.**

IMPROVING THE DELIVERY AND MARKETING OF BEEKEEPING PRODUCTS TO CONSUMERS

Abstract: *Were investigated the main features of improving the delivery and marketing of beekeeping products to consumers. According to the economic efficiency of the production and sale of farm products from beekeeping organization, the selection depends on the direction of the exercise. The majority of those involved in the production of the product through the use of intermediaries enter the market, causing the deaths of some of their large amount of money that ultimately comes down to the product quality and economic efficiency.*

Key words: *beekeeping farm, Azerbaijan, regulation, marketing.*

Language: *English*

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Delivery of the products to consumers in modern conditions, the sale of all production a key objective of the organization. It should be noted that the volume of production planning, first of all, the products will be produced in the market, in other words, they can be carried out after a certain consumers.

Consumer unpredictable, but less likely to be implemented in volume products at the planned dam is more chance of being collected. Being the subject of consumer products around the economic processes taking place in the market. Its purpose and the nature of the commodity depends on the nature of the alleged claims that, thanks to them, it is useful to man.

A number of features inherent in the product, but the features that determine the usefulness of consumer value is expressed only his. Hence, the use value of a commodity market conditions and the price of the product reflects turns carrier [2].

The development of beekeeping in the country in recent years, the number of bee families in various regions, as well as increasing productivity, as well as the sale of agricultural fairs held in the capital of the country to carry out the organization of bee products is of special importance.

Beekeeping before being sent to consumers in a variety of products for sale in accordance with the technical requirements developed. Like in the beekeeping regulations in each area should be

regulated through special accepted standards. According to the standards, labeling, packaging, acceptance, quality, identification, transportation, storage and others included.

In accordance with regulations adopted by the standards of bee products packed tare adjustment. They are coated paper tight inside wooden boxes, containers for honey, the food inside is coated with varnish, the amount of not more than 500 dm³ lifoqraf metal cans, food coated with varnish 30-45 cm³ in volume aluminum or cups, glass.

Package cans and glass, cast or printed corrugated cardboard, moisture-proof hopturulmus article, the state sanitary and epidemic control, which is available for use by the food industry, cups, paper, pergament and artificial materials in small packs and boxes, cardboard, paper and combined materials pack to frame a glorious score, ceramic dishes, trays and covered with juice can be inside [1].

Perception - is sent to the parties, all products made in beekeeping farms. At the same time, to ensure the competitiveness of the products on the market, taking into account the demands of customers according to their quality standards to determine whether the procedures are carried out using different methods and techniques. It is different when the paperwork is done.

One of the key documents about quality should be reflected in the document are as follows:

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- Enterprise (organization) name and its legal address (for natural persons - surname, first name, middle name);
- Product type (botanical source), produced by the authority;
- The year of harvest;
- The party's number;
- Number of seats to the party;
- Gross and net weight;
- Document issuance dates (veterinary certificates, invoices, etc.);
- Analysis points;
- The date of packing (packing for businesses);
- The provision of the standard;
- Produced by the trademark (if any);
- The cost of energy;
- Shelf life;
- Storage conditions;
- Information on certification;
- Information about the health of veterinary-sanitary.

Studies show that marketing activity in the country in accordance with the gradual development of the agricultural market development, supply and demand balance on the range and quality of the solution to the problems of economic activity proves that the establishment of a new content management interests. A number of reasons for this form of management transition process.

In modern times, to monitor markets successfully, the needs of today's customer orientation is no longer sufficient. I need to know that they will need tomorrow, and why they should count superior. Therefore, entities operating in the agricultural sector should be engaged in collecting information aqromarketing quality, objective assessment of the status of the marketing environment, to carry out an analysis of its performance, increasing financial risks, they find more profitable markets, as well as their attitude towards consumer-cover defining an advantage and others may be able to get.

Modern conditions during the implementation of marketing to improve its planning system and the special importance of proper organization of marketing.

First, the agricultural market increasingly dominated approach to the management of the problem and the difficulties arising from this situation to be resolved with the help of marketing, mainly due to the existing conditions.

In other words, the specific means of governance by involving, depending on the nature of the problems is important to use them in a flexible manner. In determining the rate of supply and demand, thereby giving priority to market relations, market regulation through targeted programs to include the date the request is related to the harmonious economic mechanism.

It is also connected with the agricultural sector units to coordinate with each other, bolmælərarası new form of governance is explained by an increase in demand [3].

Strategic planning and marketing planning is regarded as a single process. It should be noted, however, giving preference to a broader understanding of the strategic planning, as part of a major marketing objectives, as well as other problems are also included in the appointment. Strategic planning within the agricultural economic entities provides the foundation for all management decisions.

Strategic planning and long-term goals of the global system of economic sectors, as well as their design and reflect the development of effective management mechanism. It also allocates resources, external adaptability, enterprise workers and farm units, and the coordination of the implementation of the strategic directions. included.

Marketing plays an important role in the performance of the control system. It is clear from research that control the function of the economic managers and marketing services are beginning to realize that from that moment, they may be able to achieve the formation of a set of goals and objectives.

The above-mentioned can come to a conclusion summarizing the marketing activities of the enterprise market, but rather focus on his demand. Therefore, the focus of attention in every area of marketing, maintenance and improvements on a regular basis in accordance with the market and the effect of other important factors.

The existence and nature of inflation continued monopoly on the market, is one of the factors contributing to the free prices. Beekeeping level of prices of agricultural products, the impact of the industry to its specific features.

It then shows itself in most cases, the consumption of bee products, agricultural products and this area is crucial to the low market price elasticity limits the ability of equalization.

Here we come to the conclusion that the possibility of forming the basis of free competition keeping prices of farm products produced in other areas of the economy is relatively limited.

The rate of increase in prices of industrial products in the future growth rate of prices of bee products go, it creates conditions. For this reason, the production of bee products is growing slowly, product unit cost is expensive. In either direction, market trends, customer demands, changes in the actions of competitors, the company's business plan instability, especially in terms of production should be reflected.

In other words, taking into account the production and sale of these changes on the plan should be adjusted regularly.

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The current era of increasing formation of market relations beekeeping activity, increase in production and sales of the products to ensure

economic efficiency depends directly on proper arrangements.

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SECTION 31. Economic research, finance, innovation, risk management.

FINANCIAL CRISIS IN PAKISTAN AND ITS IMPACT ON AGRICULTURAL GROWTH

Abstract: The main aim of this study is to determine the financial crisis in Pakistan and its impact on the agricultural growth. The Gross Domestic Production GDP of Pakistan growth rate is coming down and also witnessed high fiscal and current-account deficit. The inflation which is an international problem also affected the GDP of Pakistan. The macroeconomic indicators of Pakistan showed very poor performance as Gross Domestic Product GDP growth rate declined from 6.8 % in 2007 to 4.1 % in 2008.

Key words: Financial Crisis, Agricultural Development, Economic Growth, Macroeconomic Stability, International Monetary Fund (IMF).

Language: English

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1. Introduction

2008 Global Financial Crisis was the worst crisis since Great Depression of 1930's. It emerged on global of the earth after failure of financial giants like Lehman Brothers, Bears Stearns etc. Crisis was a result of series of problems including the subprime mortgage crisis. Economic Crisis propagated through different channels like financial integration, trade. Global Financial Crisis had serious repercussions. Crisis led to liquidity problems. Poor countries were further pushed into poverty trap. World's total output decreased significantly as real GDP growth rate plunged down to -1.9 % in 2009. World's capital markets witnessed decline in stock and bond prices. Policy initiatives were taken all across the globe to mitigate the effects of crisis.

United States and European countries announced bail-out packages worth trillion of dollars. Pakistan also suffered from Financial Crisis as GDP growth rate came down and it further led to economic instability. Pakistan's current account

deficit and fiscal deficit touched the figures of 8% and 7% of GDP respectively. The paper takes into account GDP as a dependent variable and potential independent variables such as trade deficit, current account deficit, fiscal deficit and inflation. GDP has been taken as a measure of macroeconomic stability. The paper further highlights and analyzes the discretionary fiscal policy adopted by the government and tight monetary policy being pursued by the State Bank of Pakistan.

2. Literature Review of Financial Crisis

Carmen M. Reinhart (2000) says during the past few years, many countries have suffered severe currency and banking crises, producing a staggering toll on their economies, particularly in emerging-market countries. In many cases, the banking sector has been in excess of 20 percent of GDP, and output declines in the wake of crisis have been as large as 14 percent. An increasingly popular view blames fixed exchange rates, specifically "soft pegs," for



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these financial meltdowns. Not surprisingly, adherents to that view advise emerging markets to join the ranks of the United States and other industrial countries that have chosen to allow their currency to float freely [8]. At first glance, the world (with the notable exception of Europe) does seem to be marching steadily toward floating exchange-rate arrangements.

According to the International Monetary Fund (IMF), 97 percent of its member countries in 1970 were classified as having a pegged exchange rate; by 1980, that share had declined to 39 percent and in 1999, it was down to only 11 percent. Even in the Asian crisis countries' exchange rates prior to the 1997 crisis would suggest that their exchange rates looked very much like pegs to the U.S. dollar for extended periods of time. In the late 1980s and early 1990s have been the decompositions of capital flows directed to developing countries which accompanied a robust increase in overall flows.

Commercial bank lending, which supported the bulk of the debt rescheduling in early 1980s following Mexico's bank debt moratorium in August 1982, and, to a lesser extent, official flows (i.e. financial aid, concessionary and conditional loans) have given way to a substantial increase in other private inflows, that is to both short-term and long-term portfolio placements and direct investments. According to the IMF, while the total external debt of developing countries increased by almost 40% to USD 1,600 billion between 1987 and 1994, the external debt owed to non-bank private sources, which was some 14% of the total at the end of 1987, had reached almost 27% by end of 1994, and is now expected to grow to some 31% by end of 1996. Conversely, external bank debt fell from 41% of the total in 1987 to 28% over the same period, contracting in absolute terms in the process. This trend is even more pronounced if one concentrates the attention on certain subsets of developing countries.

For instance, developing countries in the Western Hemisphere (i.e., mostly Latin American countries) saw the relative importance of external private non-bank debt increased almost threefold, from about 13% to 38% of overall foreign debt, while that of commercial bank debt was halved from 62% to 31%. The global economic challenges of the 1980s, the colossal debt overhang, wild swings in exchange rates and continue observing imbalances in external payments have presented the IMF with the immense task of devising orderly and effective solutions. And they have focused unprecedented attention on the organization. Thrown suddenly and inadvertently into the epicenter of the world economic crises after the 1973-1974 oil price shocks,

the IMF has gradually and erroneously come to be seen as the world's master economic trouble-shooter. A limited-purpose organization, conceived in 1944 to deal with 1930s style exchange and payments problems, the Fund has recently been pushed by circumstances into becoming a superagency in charge of the global debt and development problems of the 1970s and 1980s tasks for which it has neither adequate expertise nor sufficient resources.

Borrowing from the IMF did not initially involve 'conditionality' this was introduced in the 1950s as the USA continued to fear that it might in effect be required to underwrite the Fund's lending operations. By the time the Bretton Woods system was up and running at the end of the 1950s, when the free convertibility of European currencies was introduced, the IMF had assumed the general role of overseeing, or even managing, the Bretton Woods system. This system involved countries pegging the par values of their currencies, and only altering them in the event of a 'fundamental disequilibrium', where domestic and external policy targets became incompatible at the pegged exchange rate. However, not all currencies were treated equally. The US dollar was made the pivot of the system, with its price being tied to gold.

Countries in economic crisis that turn to the IMF for supporting habit their ability to attract multinational investors, countries weathering a financial crisis attract fewer FDI inflows if they sign IMF agreements. As the debate about international financial reform was going on, the world was in effect forced by expediency to adopt generalized flexible exchange rates in 1973 to try and correct persistent currency misalignment, and encountered an enhanced need for international financial intermediation in the context of the quadrupling in the price of oil in 1974, which created large surplus in the oil exporting countries and large deficits among oil importers. While the Fund responded by creating a temporary oil facility designed to recycle oil revenues from oil producers to countries with oil-related balance of payments deficits, the task of recycling petrodollars was largely performed by private international banks. Early in the 1980s, and partially in response to a second big increase in oil prices at the end of the 1970s and a change in the dominant economic paradigm, the Fund had retreated from the EFF and had, in effect, phased out low conditionality lending through reforms to the CFF. The emphasis had returned to conventional macroeconomic stabilization based on controlling aggregate demand through fiscal and monetary policy.

In the late 1980s, the Fund offered an institutional response to concern that it was under-emphasizing the supply side and the social

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consequences of adjustment. Its rhetoric began to refer more to encouraging economic growth as a 'primary' objective of adjustment programmers and protecting 'vulnerable groups' from the costs of adjustment. Perhaps most notably, the Fund introduced in 1987 the Enhanced Structural Adjustment Facility (ESAF). This was targeted at low income countries and emphasized a broader range of conditionality which, while still including conventional demand-side measures, also included specific supply-side and microeconomic measures. Hamilton (2005) argues that a potential macroeconomic effect of oil price is on the inflation rate as long run inflation rate is governed by monetary policy, and so ultimately it depends on how the central bank responds to oil prices. Nevertheless, LDC debt to foreign bankers is beyond redemption, as the laws of mathematics operate inexorably to accelerate the interest burden beyond even the most optimistic assessment of ability to pay.

3. Impact on Pakistan GDP

Global Financial Crisis hampered Pakistan’s economic growth to a great extent. Deteriorating foreign exchange reserves position due to Balance of Payment crisis compelled Government of Pakistan to approach IMF for a bail out package. Foreign Direct Investment (FDI) carries a considerable importance in economic growth and as a result of Global

Financial Crisis. FDI came down from \$5410 million in 2008 to \$3720 million in 2009. Global Financial Crisis has also widened the Trade Gap in Pakistan as Trade Deficit rose to 12.8 % of GDP in 2008.

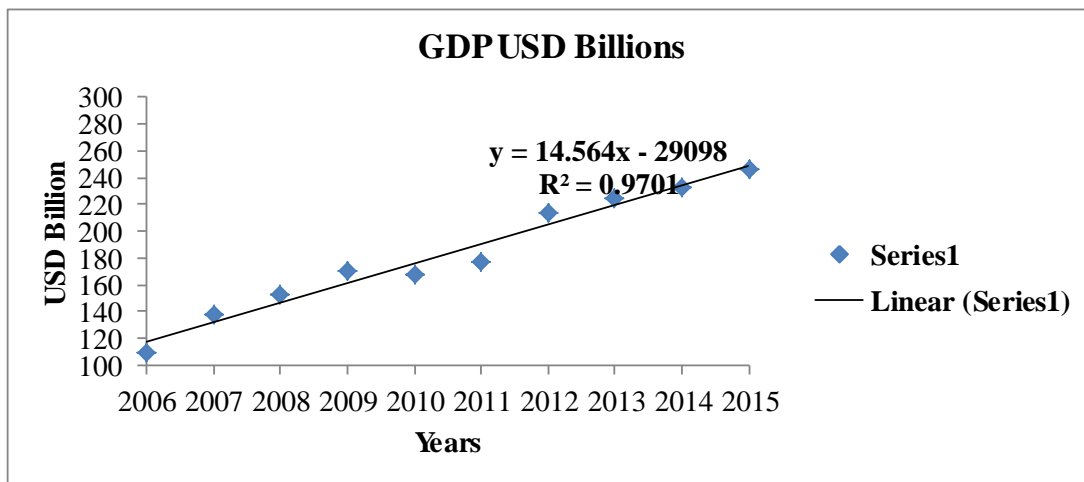
Unfortunately, Pakistan was suffering from different problems and thus government was not in a condition to provide a bail-out package. Pakistani government had adopted tight monetary policy to curb the rising inflation and similarly it also went for an expansionary fiscal policy as there is no room for counter cyclical fiscal policy.

Pakistan faces a major challenge of achieving macroeconomic stability and putting economy back on track. Fiscal and Monetary Policy carry a relative importance and thus there is a need to study the effectiveness of both the Fiscal and Monetary Policy in stabilization of Global Financial Crisis.

Global Financial Crisis has brought attention towards many issues. Crisis has revealed that there is a need for reformation. International Monetary Fund needs reformation. Similarly, there is a lot of betterment required in financial system of the World.

4. Pakistan GDP Last Ten Years (2006-2015)

The Gross Domestic Production GDP, GDP growth rate and GDP per capita of Pakistan is graphically shown in fig 1, fig 2 and fig 3.



Data source: Pakistan Bureau of Statistics

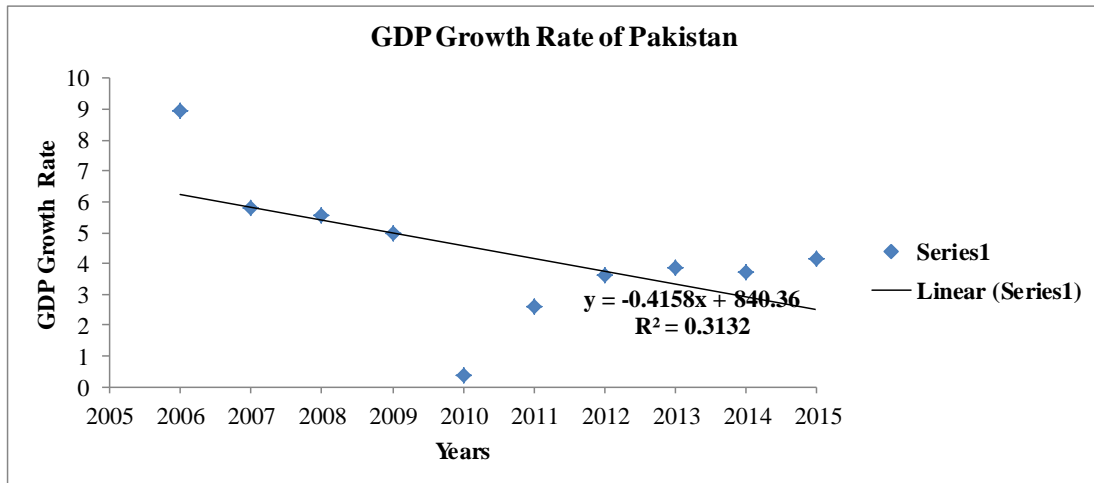
Figure 1 – GDP USD Billions.

During ten years from 2006 to 2015 fig 1 shows an increase in its total GDP. Overall trend of GDP shows depicts steep value. The minimum value was recorded in 2006 i.e., 109.5 USD Billion and

maximum value i.e., 246.88 USD Billion was recorded in 2015 shows an increase of one fold of its original value.

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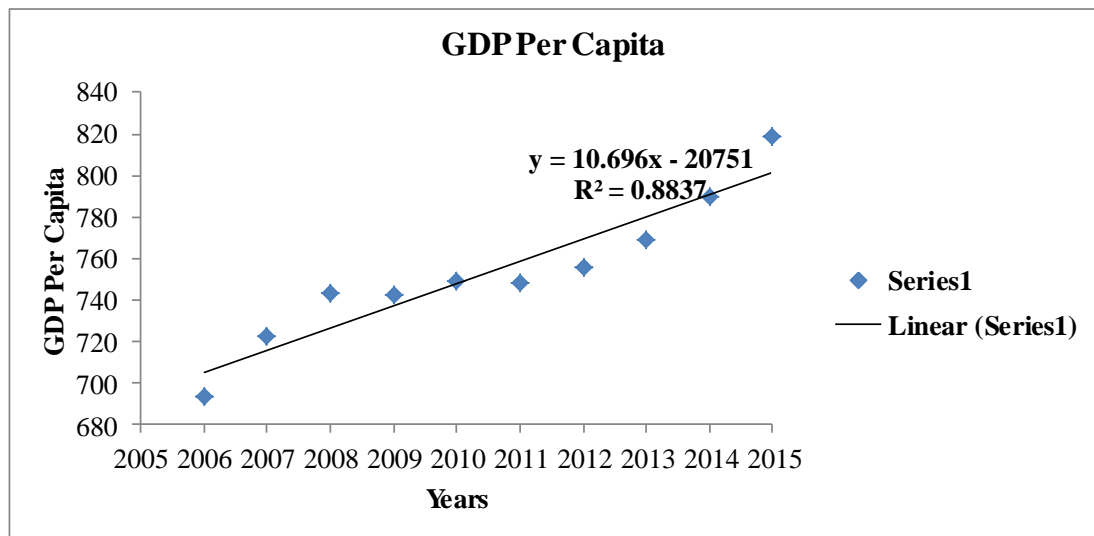


Data source: Pakistan Bureau of Statistics

Figure 2 – GDP Growth Rate of Pakistan.

Overall GDP growth rate shows steep value. The minimum value was recorded in 2006 i.e., 8.96

and maximum value 4.14 was recorded in 2015 and overall value was decreased.



Data source: Pakistan Bureau of Statistics

Figure 3 – GDP Per Capita.

Graph shows an increase in GDP per Capita for first three years and last three years, but there was a stagnant curve between two periods.

5. Conclusion

Pakistan’s deteriorating macroeconomic conditions after the Global Financial Crisis had resulted in sharp downfall in GDP growth rate. Real GDP growth rate declined significantly in 2008 as it reached to 1.6 % and in 2009 it rose slightly to 3.4

%. Unfortunately, Pakistan was already suffering from macroeconomic instability before the Financial Crisis due to hike in oil prices and depleting foreign exchange reserves. Financial Crisis widened trade gap. Increase in budget and current account deficits and soaring inflation brought further problems for Pakistan’s economy.

Under IMF agreement Pakistan has to adopt tight fiscal and monetary policies. IMF programme is

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directed towards restoring macroeconomic stability in Pakistan. State Bank of Pakistan has increased discount rates to curb inflation but it has also hampered economic growth. Private investment is restricted due to increase in discount rates. Public finances remain in a precarious state. Pakistan has no fiscal space and there is less room for counter cyclical fiscal policy. In counter cyclical fiscal policy, taxes are cut and spending is increased during downturns to promote economic recovery and growth. Discretionary fiscal policy cannot be adopted in Pakistan as public debt is high and government is unable to finance the resulting fiscal deficit. Tax evasion is already on peak in Pakistan and as a result Pakistan's tax to GDP ratio is very low.

It can easily be concluded that GDP is one of the measures of macroeconomic stability and regression results have made it clear that Current Account Balance, Trade Deficit and even Inflation had an impact on GDP. Multiple Regression Analysis has depicted that Null Hypothesis should be accepted. Global Financial Crisis had a severe impact on macroeconomic stability of Pakistan. Null Hypothesis that high fiscal deficit decreased GDP growth has not been justified by the regression analysis. Null Hypothesis that widening of trade deficit has caused decline in GDP needs to be accepted as shown by the regression results.

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SECTION 24. Sociological research.

TRANSFORMATION OF LANGUAGE SPACE OF THE COUNTRIES OF CENTRAL ASIA AND TRANSCAUCASIA

Abstract: The article presents the results of a comparative study of linguistic space of the countries of Central Asia and Transcaucasia. It is based on the results of the sociological polls, statistical materials and publications devoted to the ethnic and linguistic transformations in post-Soviet space.

Key words: linguistic space, national language, official language, Russian language, ethnic identification, Central Asia, Transcaucasia.

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ТРАНСФОРМАЦИЯ ЯЗЫКОВОГО ПРОСТРАНСТВА СТРАН ЦЕНТРАЛЬНОЙ АЗИИ И ЗАКАВКАЗЬЯ

Аннотация: В статье представлены результаты сравнительного исследования языкового пространства стран Центральной Азии и Закавказья. Она основана на результатах социологических опросов, статистических материалах и публикаций, посвященных этническому и лингвистическим трансформациям на постсоветском пространстве.

Ключевые слова: языковое пространство, национальный язык, официальный язык, русский язык, этническая идентификация, Центральная Азия, Закавказье.

Языковое пространство – это прочный, устойчивый ареал распространения того или иного языка, в первую очередь как родного и официально закрепленного на определенной территории [15, с. 152].

Несмотря на единую предысторию в пространстве бывшего СССР, после распада страны языковая ситуация в каждой республике стала отличаться определенной спецификой. Однако общей чертой во всех государствах постсоветского пространства стало ошутимое сокращение числа владеющих русским языком.

В советский период происходило выстраивание этноцентрического государства с ориентацией на доминирующую нацию – русскую. Это привело, в первую очередь, к русификации городов, где представители «европейских национальностей» составили своего рода профессиональную элиту [2, с. 25].

Объективными предпосылками для этого стали: утверждение статуса государственного

языка за титульными национальными языками, сокращение количества этнических русских как основных носителей русского языка и культуры, а также переориентация молодежи на знание европейских языков и языков крупных стран регионального окружения.

Как представляется, динамика интеграции находится во взаимосвязи с этническими и языковыми процессами в Центральной Азии (ЦА) и Закавказье. В частности, русский язык признан официальным в государствах ЦА, имеющих значительную долю русскоязычного (в основном русского по национальности) населения, которая в настоящее время составляет в Казахстане 21,5%, в Кыргызстане – 6,5%. Именно они являются членами всех межгосударственных объединений наряду с Российской Федерацией. Наименьшую вовлеченность в интеграционные процессы демонстрируют Узбекистан, где около 2% русских, и Туркменистан (3,2%). Там русский язык законодательно признан языком межнационального



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общения, но его значение в сфере науки и образования невелико.

После распада СССР демографические и миграционные процессы в этих странах привели к значительным изменениям их национального состава [18, с. 102–103]. За 25 лет суверенитета в Казахстане резко сократилась доля славянского населения (русских и украинцев), немцев и татар – более чем на 4 млн. чел. При этом численность казахов увеличилась на 4,7 млн. жителей. Доля русских, составлявших в 1989 г. 38%, сократилась до 22% от общего числа жителей [1].

По данным статистики видно, что сходные процессы происходили в соседнем Кыргызстане, где представители титульной нации в настоящее время составляют три четверти населения республики [12]. Вместе с тем, доля русских, по нашим подсчетам, сократилась в 3 раза, украинцев – в 8 раз, немцев – в 12 раз, татар – в 31 раз [9, с. 96].

К субъективным предпосылкам можно отнести, во-первых, неблагоприятные политические условия для распространения русского языка, ухудшение которых связывают с началом «украинского кризиса» 2014 года. С другой стороны, проблема статуса русского языка в Украине лежит в основе продолжающегося конфликта. Во-вторых, сократилось количество русскоязычных образовательных учреждений и ухудшилось их материальное положение. Оплотом на постсоветском остаются учрежденные совместно с Россией «Славянские» университеты: Кыргызско-Российский (КРСУ), Российско-Таджикский, Российско-Армянский и Белорусско-

Российский, где обучаются около 20 тыс. студентов, две трети из которых – по российским образовательным программам.

В качестве предмета изучения русский язык постепенно от родного или второго родного языка переходит к иностранному языку, изучаемому факультативно (в странах Балтии, Азербайджане, Грузии, Туркменистане). Искусственные ограничения русскоязычных коммуникационных ресурсов заметны в Украине, Туркменистане, Грузии и Молдове. По мнению аналитиков, позиции русского языка надежно обеспечиваются только в Беларуси, где он остается государственным языком и доминирует в СМИ.

Результаты опросов общественного мнения в странах постсоветского пространства (без стран Балтии и Туркмении) показали, что нуждаются в знании русского языка: для работы 15% респондентов, для просмотра кинофильмов и телепередач – 19%. Почти все опрошенные (96%) высказали желание, чтобы их дети знали русский язык, так как владение им считается важным преимуществом [17]. По данным на 2011 г., признают себя свободно владеющими русским языком 90% жителей Казахстана, 66% – Армении, 60% – Кыргызстана, 45% – Грузии и только 23% Азербайджана (таблица 1). Предпочитают общение на нём в основном жители Казахстана и Кыргызстана.

Таблица 1

Владение русским языком в странах СНГ (по данным Института Gallup 2011 г.) [17]

Страна	Владеют русским языком (%)	Из них свободно (%)	Предпочитаемый язык общения – русский (%)*
Казахстан	99,9	89,6	68
Узбекистан	99,2	85,3	-
Армения	93,3	66,3	3
Кыргызстан	87,1	60,5	38
Грузия	78,4	44,8	7
Азербайджан	70,1	22,8	6
Таджикистан	68,5	41,2	5

* По данным опросов 2007 г.

Данные этого исследования демонстрируют значительный разрыв между желаниями и возможностями респондентов.

То есть в Казахстане и Кыргызстане русский язык еще находится на достаточно высоком уровне. Однако в Азербайджане 47% опрошенных признают, что «очень плохо понимают русскую

речь», в Грузии таких более 25%, в Таджикистане – 12%.

Казахский язык, обладая статусом государственного, функционирует в основном в казахской этнической среде и так и не стал языком межэтнической коммуникации [11, с. 46]. Русские и другие национальные меньшинства страны не хотят, чтобы русский язык и другие их привычные

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символы ушли на периферию нового общества [6, с. 41] Нативизация (казахизация) сталкивается с сильными позициями русского языка и русско-советской культуры, обретенными еще в советский период и продолжающими доминировать в силу инерционности культурных процессов [7, с. 60].

Русский язык намного чаще звучит в городе, поэтому есть стимул изучать его для карьерных целей. Вместе с тем, казахоязычие стало основным средством социальной коммуникации для тюркоязычных народов страны (узбеков, азербайджанцев, турок, уйгуров, дунган). Позиции казахского языка укрепляются в связи с миграцией «оралманов» – этнических казахов-репатриантов из соседних стран, которые не владеют русским языком [5, с. 102]. Золотухин С.А. отмечает, что в последние годы русскоязычные родители стали

отдавать детей в дошкольные учреждения с воспитателями-казахами в целях освоения разговорного языка титульной нации.

В советский период на территории Армянской ССР сложилась уникальная билингвальная среда, нехарактерная для мононационального состава населения, поскольку в республике 90% жителей составляли армяне. Почти половина населения равноценно владела армянским и русским языками, при этом нередки были случаи доминирования последнего. Эта ситуация имела место благодаря проводимой языковой политике, хорошо разработанной методической базе преподавания русского языка в средней и высшей школах и наличию в Армении высококвалифицированных специалистов-русистов [4, с. 96].

Таблица 2

Количество и доля жителей Армении, признавших русский язык родным [16]

	Общее число жителей (чел.)	Признали русский язык родным (чел.)	Доля от общего числа жителей (%)	Доля по признаку пола (%)		Доля по месту проживания (%)	
				муж.	жен.	город	село
РА в целом	3018854	23434	0,8	33,8	66,2	75,8	24,2
<i>из них:</i>							
армяне	2961801	11861	0,4	36,9	63,1	82,7	17,3
украинцы	1176	357	30,4	19,3	80,7	89,9	10,1
русские	11911	10466	87,9	31,3	68,7	67,1	32,9
греки	900	88	9,8	21,6	78,4	86,4	15,6
ассирийцы	2769	81	2,9	30,9	69,1	58,0	42,0
грузины	617	75	12,2	28,0	72,0	93,3	6,7
езиды	35308	79	0,2	35,4	64,6	48,1	51,9

Несмотря на то, что русский язык признали родным менее одного процента населения, его реальный статус гораздо выше правового. Не претендуя на роль государственного языка, он продолжает оставаться в Армении языком межнационального общения и межкультурной коммуникации: им свободно владеют около 70% жителей [4, с. 99].

В Таджикистане, несмотря на норму статьи 2 Конституции 1994 г., закон «О государственном языке» №553 от 5 октября 2009 г. первоначально не содержал указания на статус русского языка как языка межнационального общения. Однако, учитывая сложившуюся практику большинства государственных органов вести делопроизводство на русском языке, 9 июня 2011 г. этот статус был возвращен [3].

По данным переписи населения, в Таджикистане число русских к 2010 году сократилось в 11 раз, а их доля составила всего 0,5%. Количество таджиков выросло более чем в

два раза, а их доля вместе с узбеками (второй по численности нации) достигла 96,5% [13]. Материалы данной переписи показывают, что значение русского языка в качестве второго, которым жители владеют свободно, для национальных меньшинств невелико. При сопоставлении показателей владения таджикским и русским языками видно, что государственный язык сохраняет приоритет и в качестве языка межнационального общения. В частности, таджикским языком свободно владеют 52% узбеков (русским – 10%), 31% кыргызов и туркмен (русским – по 11%). Важно учесть, что узбеки, кыргызы и туркмены составляют в совокупности более 1 млн. жителей страны (около 16%). Только среди татар, численность которых по результатам переписи всего 6,5 тыс. чел., доля свободно владеющих русским языком вдвое больше, чем таджикским (45 против 23%) [10].

Распространение русского языка в советский период происходило как под влиянием

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геополитических факторов, в результате действия административных методов, так и за счет целенаправленной государственной политики СССР по предоставлению образовательных услуг иностранным студентам. Около 1 млн. человек получили дипломы советских вузов [8 с. 99].

В настоящее время в вузах России также обучаются студенты из зарубежных стран, причем две трети из них приходится на государства Центральной Азии (табл. 4).

Таблица 3

Численность иностранных граждан, обучавшихся в вузах России [16, с. 19, 26]

Страна	2012/2013 учебный год		2013/2014 учебный год	
	Количество студентов (чел.)	Доля от общего числа иностранных студентов (%)	Количество студентов (чел.)	Доля от общего числа иностранных студентов (%)
Армения	4934	7,1	5479	6,8
Азербайджан	2058	3,0	2639	3,3
Грузия	936	1,3	977	1,2
Казахстан	23656	33,9	27524	34,0
Кыргызстан	2627	3,8	3591	4,4
Таджикистан	5660	8,1	6561	8,1
Туркменистан	10954	15,7	12114	15,0
Узбекистан	5605	8,0	6288	7,8

Примечательно, что треть от общего числа иностранных студентов являются гражданами Казахстана, территориально примыкающего к границам РФ и в наибольшей степени вовлеченного в интеграционные процессы в рамках СНГ, ЕАЭС и Таможенного союза. Однако более одной пятой части студентов-иностранцев представляют Туркменистан и Узбекистан – государства, проявляющие более независимую политику, в том числе и в языковой сфере.

С одной стороны, абсолютные показатели численности студентов-иностранцев дают возможность надеяться, что будущие выпускники российских вузов, вернувшись на родину, смогут преумножить роль и значение русского языка в своих государствах. С другой стороны, статистические данные не позволяют уточнить, какова среди них доля представителей русскоязычного меньшинства, получающего в России образование на родном для них языке.

Важным представляется и то, что получение российского диплома об образовании повышает шансы будущих специалистов остаться работать в России или Казахстане, активно принимающих трудовых мигрантов из соседних стран.

Исследование показало, что несмотря на сокращение этнолингвистического пространства русского языка, наибольшие шансы для сохранения его на постсоветском остаются у Республики Казахстан. Важными предпосылками для этого стали: значительная доля русскоязычного населения, официальный статус русского языка и последовательная политика интеграции с Россией. Как представляется, постепенная изоляция отдельных стран Центральной Азии и Закавказья от достижений русской культуры, образования и научного знания препятствует дальнейшим интеграционным процессам в регионе, а также легализации и получению достойного места работы трудовыми мигрантами.

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SECTION 27. Transport.

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SUBSTANTIATION OF DEVELOPMENT OF THE VOLUMETRIC-TYPE FUEL-WATER FILTER FOR FILTRATION OF DIESEL FUELS

Abstract: The first and second parts of this article provide the information about the most common methods of fuel filtration from mechanical impurities and water. The third part is devoted to the calculation of the design parameters of the fuel-water filters of any sizes. The results of experimental studies of prototypes of the filters are presented in the fourth part of the article. The general conclusions and recommendations on the use of the fuel-water filters are given in the end of the article.

Key words: diesel fuel, fuel filtration, dewatering element, fuel-water filter.

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ОБОСНОВАНИЕ РАЗРАБОТКИ ФИЛЬТРА-ВОДООТДЕЛИТЕЛЯ ОБЪЕМНОГО ТИПА ДЛЯ ФИЛЬТРАЦИИ ДИЗЕЛЬНОГО ТОПЛИВА

Аннотация: В первой и второй частях данной статьи приводятся сведения о наиболее распространенных способах фильтрации топлива от механических примесей и воды. Третья часть посвящена расчету конструктивных параметров фильтров-водоотделителей любого типоразмера. В четвертой части статьи приведены результаты экспериментальных исследований опытных образцов фильтров. В заключении даны общие выводы и рекомендации по применению фильтров-водоотделителей.

Ключевые слова: дизельное топливо, фильтрация топлива, водоотделяющий элемент, фильтр-водоотделитель.

1. Введение

Эффективность работы дизельных двигателей, их мощностные показатели и надежность зависят от технического состояния топливной аппаратуры двигателей. Экономические затраты, связанные с повышенным износом деталей топливной аппаратуры, с увеличенным расходом топлива, значительным количеством отказов в процессе их работы, очень велики, поэтому разработка

эффективных средств очистки дизельного топлива от воды представляют актуальную задачу [1, 2].

2. Гравитационное отстаивание дизельных топлив

Отстаивание или седиментация, является наиболее простым способом обезвоживания топлив. Удаление свободной воды из топлива



осуществляется путём осаждения капель воды под действием гравитационной силы [1, 2, 5].

Для определения скорости осаждения частиц воды в поле гравитации можно использовать следующую формулу [1, 2]:

$$V_{oc} = \frac{g * d^2 * (\rho_w - \rho_m)}{18 * \mu_m}, \text{ м/с} \quad (1)$$

где g – ускорение свободного падения, м/с²; d – диаметр капли, м; ρ_w, ρ_m – соответственно плотность воды и топлива, кг/м³; μ_m – динамическая вязкость топлива, Н*с/м².

Современные представления о процессах протекающих при обезвоживании дизельных топлив методом гравитационного отстаивания изложены в [1, 5].

2. Современные представления о механизме обезвоживания топлив пористыми коагулирующими перегородками

В соответствии с современными представлениями механизм обезвоживания топлив коагулирующей перегородкой включает следующие этапы: приближение и соприкосновение микрокапель воды с волокнами; вытеснение микрокапель воды топливной плёнкой с поверхности волокна; адгезию микрокапли воды к волокну; коалесценцию микрокапель воды, прилипших к волокну с микрокаплями, находящимися в потоке; отрыв капли с поверхности волокна; течение водотопливной эмульсии через коагулирующую перегородку; осаждение капель воды в отстойник [4, 6].

Вытеснение топливной пленки с поверхности волокна.

Адгезия микрокапли воды к волокну может произойти только тогда, когда между ними нет топливной плёнки. Поэтому, капля воды должна вытеснить топливную плёнку с волокна и смочить его. Этот процесс зависит от поверхностных свойств волокна [1, 2].

Топливная плёнка довольно легко смещается с гидрофильных поверхностей (стекло, хлопок), значительно труднее – с гидрофобных, обладающих низкой поверхностной энергией (тефлон, полиэтилен).

Процесс вытеснения топливной плёнки начинается с уменьшения её толщины, у маловязких топлив она может быть менее 0,5 мкм. При коалесценции промежутков времени между соприкосновением капли с волокном и разрывом топливной плёнки достигает нескольких секунд и даже минут [7].

Установлено, что время стекания плёнки пропорционально величине радиуса капли воды, умноженной на 1,5, то есть время стекания плёнки в первоначальный период, когда капли воды малы, не вызывает существенного влияния

на продолжительность их присоединения к волокнам или к другим каплям, задерживаемым на волокнах. Впоследствии время стекания топливной плёнки возрастает, так как скоагулировавшаяся вода представляет собой крупные капли и для удаления топливной плёнки требуется значительно большие промежутки времени, чем для микрокапель воды, содержащихся в исходном топливе [8].

Адгезия капли воды к поверхности волокна.

После вытеснения топливной плёнки с волокна начинается процесс адгезии капли воды к его поверхности. Адгезия капли воды к поверхности волокон коагулирующей перегородки происходит за счёт уменьшения свободной энергии на поверхности раздела трёх фаз [9].

Для установления влияния различных факторов на адгезию капли воды к поверхности обычно рассматривают этот процесс на плоской, сферической и цилиндрической поверхностях.

В трёхфазных системах свободная поверхностная энергия на границе раздела между жидкостью и плоской твёрдой поверхностью в равновесном состоянии равна:

$$F = \sigma * S \quad (2)$$

где σ – поверхностное натяжение жидкости, Н/м; S – площадь соприкосновения жидкости и твёрдой поверхности, м²

Сферическая капля воды после соприкосновения растекается на плоской твёрдой поверхности и достигает равновесного состояния с краевым углом θ (рис. 1).

При этом имеет место соотношение [10]:

$$\sigma_{n-m} - \sigma_{n-e} = \sigma_{e-m} * \theta \quad (3)$$

где $\sigma_{n-m}, \sigma_{n-e}, \sigma_{e-m}$ – межфазное натяжение, соответственно, на границе раздела «поверхность – топливо», «поверхность – вода» и «вода – топливо».

На основании формулы (2) свободная поверхностная энергия на поверхности раздела:

- до адгезии:

$$F_0 = \sigma_{e-m} * S_0 + \sigma_{n-m} * S_{n-e} \quad (4)$$

- после адгезии:

$$F = \sigma_{e-m} * S_{e-m} + \sigma_{n-m} * S_{n-e} \quad (5)$$

Тогда уменьшение свободной энергии в результате адгезии капли воды к поверхности можно определить из выражений:

$$-\frac{\Delta F}{\sigma_{e-m} * S_0} = 1 - \frac{1}{2} * [2 * (1 - \cos \theta)^2 * (2 + \cos \theta)]^{\frac{1}{3}} \quad (6)$$

$$\frac{S_{e-m}}{S_0} = \left[\frac{2}{(1 - \cos \theta) * (2 + \cos \theta)^2} \right]^{\frac{1}{3}} \quad (7)$$

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где $-\frac{\Delta F}{\sigma_{e-m} * S_0}, \frac{S_{e-m}}{S_0}$ – соответственно относительное уменьшение свободной поверхностной энергии и относительное изменение поверхности раздела между топливом

и каплей воды вследствие её адгезии к поверхности для краевых углов от 0 до 180°.

Таким образом, из выражений (6) и (7) следует, что адгезия капли воды к плоской твёрдой поверхности определяется лишь свойствами этой поверхности, то есть величиной краевого угла.

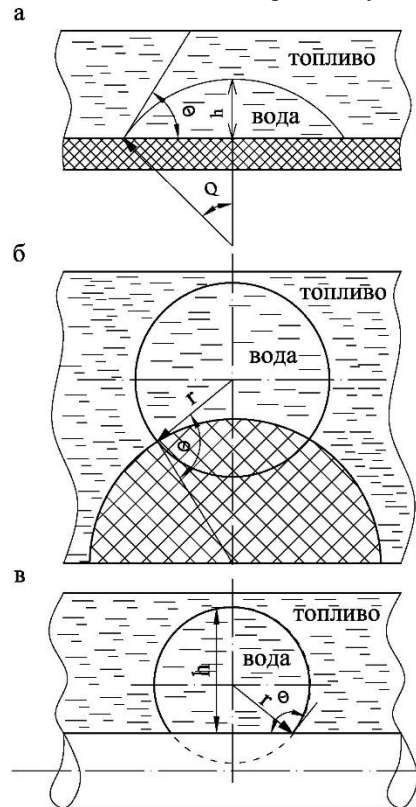


Рисунок 1 – Равновесное состояние капли на поверхности.

а – плоская поверхность; б – сферическая поверхность; в – цилиндрическая поверхность

Установлено, что формула (2) справедлива и для случая адгезии капли на сферической поверхности. На рисунке 1.б показано равновесное состояние капли на твёрдой сферической поверхности с краевым углом θ .

Для сферической поверхности уравнения имеют вид:

$$-\frac{\Delta F}{\sigma_{e-m} * S_0} = \frac{1}{2r_0^2} \frac{r * (2 * r - y) * R * x * \cos \theta}{2r_0^2} \quad (8)$$

$$\frac{S_{e-m}}{S_0} = \frac{r * (2 * r - y)}{2 * r_0^2} \quad (9)$$

где r_0 – относительный радиус капли, м.

Следовательно, адгезия капли воды к сферической поверхности уменьшается с уменьшением диаметра капли и увеличением краевого угла. Относительное уменьшение свободной поверхностной энергии на сферической поверхности при адгезии к ней каплей воды меньше, чем на плоской [1, 2].

При адгезии капли воды к цилиндрической поверхности (рис. 1.в), относительное уменьшение свободной поверхностной энергии имеет промежуточное значение, находящееся между показателями для плоской и сферической поверхностей [8].

Таким образом, из проведённого анализа процесса адгезии следует, что [1, 2, 13, 15]:

- эффективность адгезии капли воды к волокну определяется его поверхностными свойствами (углом θ) и диаметром, а также размером капли воды;

- чем меньше диаметр волокна и больше размер капли, тем быстрее происходит адгезия капли к поверхности волокна.

Следовательно, при разработке коагулирующих элементов для фильтроводоотделителя, необходимо учитывать поверхностные свойства волокон, так как от их правильного подбора во многом зависит процесс

адгезии и эффективность коалесценции микрокапель воды в волокнистом слое [2].

Коалесценция капель воды в коагулирующей перегородке.

При обезвоживании топлив механизм коалесценции капель воды в коагулирующей перегородке зависит от их размера, в связи с чем различают два вида эмульсии воды в топливе – первичную, состоящую из микрокапель воды диаметром 10 мкм и более, и вторичную, состоящую из микрокапель, большинство которых имеет диаметр менее 1 мкм [8].

Коалесценция капель, составляющих первичную эмульсию, происходит по двум механизмам.

В первом случае капли коагулируются на смачиваемой ими поверхности волокнистого материала, образуя жидкостную плёнку, которая стекает по наружной поверхности перегородки.

Во втором случае происходит межкапельная коалесценция в порах коагулирующей перегородки, в этом случае волокна не смачиваются.

Эффективность отделения капель воды их первичных эмульсий определяется отношением средних диаметров капель на входе в коагулирующую перегородку и на выходе из неё и зависит от механизма коалесценции. Обычно эффективность отделения капель воды выше, если они смачивают волокна. При выборе волокон основное значение придаётся структуре волокнистого слоя, поры которого должны быть не менее размера поступающих капель, то есть необходимо учитывать возможность дробления капель воды в результате прямого удара об волокна.

Поэтому, при оптимизации процесса обезвоживания топлива существенную роль играет правильный выбор пористой волокнистой структуры коагулирующей перегородки [1, 2].

Механизм коалесценции вторичных эмульсий значительно отличается от рассмотренных выше и заключается в том, что в начале происходит адгезия капли к поверхности волокна и лишь затем её коалесценция с другой каплей. Конечной задачей, достигаемой при коалесценции капель воды из вторичных эмульсий, является увеличение их размеров до такого уровня, при котором их можно рассматривать как первичную эмульсию. Разделение вторичных эмульсий в пористом слое более эффективно в системах с высоким межфазным натяжением и большой разностью плотностей воды и топлива. При этом особенно важен выбор волокон коагулирующей перегородки. Наиболее эффективными являются пористые среды из тонких волокон с большой шероховатостью. При этом эффективность

разделения эмульсий возрастает с уменьшением диаметра волокон [8].

Отрыв капель воды с поверхности волокна.

При достижении определённых критических размеров капля под действием гидродинамической силы потока и собственной массы срывается с поверхности волокна и выносится из волокнистого пористого слоя в отстойную зону, где вследствие резкого уменьшения скорости и изменения направления потока осаждаётся в отстойник [6, 11].

Критическую скорость потока ($V_{кр}$), перепад давления ($\Delta P_{кр}$) и объём капли ($U_{кр}$), при которых капля срывается с волокна, можно определить по формулам [16]:

$$V_{кр} = \frac{K_n}{\mu * S_n * L} * \sqrt{l^2 * (\sigma_e - \sigma_m + \sigma_{e-m} * \cos\theta)^2 - U^2 * g^2 * (\rho_e - \rho_m)^2} \quad (10)$$

$$U_{кр} = \frac{1}{K_n * (\rho_m - \rho_e) * g} * \sqrt{l^2 * (\sigma_e - \sigma_m + \sigma_{e-m} * \cos\theta * K_n)^2 - V^2 * \mu^2 * S_n^2 * L^2} \quad (11)$$

$$\Delta P_{кр} = \frac{1}{S_n} * \sqrt{l^2 * (\sigma_e - \sigma_m + \sigma_{e-m} * \cos\theta)^2 - U^2 * g^2 * (\rho_e - \rho_m)^2} \quad (12)$$

где K_n – коэффициент проницаемости, м²; U – объём капли, м³; S_n – поперечное сечение поры, м²; l – периметр соприкосновения капли с поверхностью волокна, м.

Анализ уравнений (10-12) показывает, что с увеличением периметра (l) соприкосновения капли с волокном, перечисленные показатели возрастают.

Следовательно, для уменьшения усилия отрыва капли с поверхности волокна, важную роль играет правильный выбор волокон для коагулирующей перегородки [1, 2].

Течение водотопливной эмульсии через коагулирующую перегородку.

Течение водотопливной эмульсии через коагулирующую перегородку представляет собой совместное ламинарное течение двух несмешивающихся жидкостей, подчиняющихся закону Дарси.

В начальный момент работы фильтра-водоотделителя топливо проходит через коагулирующую перегородку, в которой нет воды, и гидравлическое сопротивление потоку топлива обусловлено только трением. По мере накопления воды в перегородке, гидравлическое сопротивление возрастает за счёт уменьшения площади поперечного сечения. В результате перепад давления на пористой перегородке достигает величины достаточной для продавливания через неё воды. При насыщении перегородки водой до равновесного состояния, в пористой перегородке образуются непрерывные

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водяные каналы, по которым проталкивается вода.

При движении воды и топлива по отдельным непрерывным каналам поверхностное натяжение на границе раздела этих жидкостей отсутствует, и гидравлические потери будут минимальными, зависящими от скорости потока топлива.

Следует отметить, что вода проходит через коагулирующую перегородку по избирательным каналам, которые используются неоднократно. При отсутствии воды в топливе водяные каналы рвутся и снова восстанавливаются в случае её появления, проходят по тем же каналам.

На выходе из коагулирующей перегородки происходит отрыв капель воды, которые имеют сферическую форму.

Размеры капель воды зависят от скорости потока топлива, структуры пористого слоя на выходе из коагулирующей перегородки и величины поверхностного натяжения на границе раздела вода – топливо.

Осаждение капель воды в отстойную зону.

Процесс обезвоживания топлива завершается после того, как укрупнённые капли выйдут из пористой перегородки коагулирующего элемента и попадут в корпус фильтра-водоотделителя, где за счёт резкого изменения скорости и направления потока, а также под действием эффективной силы тяжести происходит их осаждение в отстойную зону фильтра-водоотделителя [1, 2].

Для обеспечения наибольшей эффективности осаждения капель воды большое значение имеет правильный выбор соотношения геометрических размеров корпуса фильтра-водоотделителя и элементов [1, 2].

3. Расчет конструктивных параметров фильтров-водоотделителей любого типоразмера

Ниже приведены основные формулы для расчёта параметров ФВ и топливопроводов системы топливоподачи. Приведённые зависимости можно использовать для расчёта ФВ любого типоразмера [12].

Ширина кольцевого зазора.

Расчёт конструктивных параметров ФВ сводится к определению оптимальной ширины кольцевого зазора между корпусом и

водоотделяющим элементом, высоты элемента и корпуса, и объёма отстойной зоны (рис. 2) [12].

Определение ширины кольцевого зазора приведено в [12]

Высота фильтра-водоотделителя.

Габаритная высота ФВ определяется высотой водоотделяющего элемента, объёмом отстойной зоны и величиной зазора между крышкой и элементом (см. рисунок 2), то есть:

$$H_{\text{фв}} = h_3 + h_{\text{эл}} + h_{\text{от}}, \text{ м} \quad (13)$$

где h_3 – высота зазора между крышкой и элементом, м; $h_{\text{эл}}$ – высота водоотделяющего элемента, м; $h_{\text{от}}$ – высота отстойной зоны, м.

Высота водоотделяющего элемента определяется из условия необходимой пропускной способности ФВ и допустимой скорости фильтрации, при которой обеспечивается требуемая эффективность обезвоживания топлива.

Расчётная поверхность фильтрации коагулирующей ступени водоотделяющего элемента определяется по формуле [2]:

$$F = \frac{Q}{V_{\phi}}, \text{ м}^2 \quad (14)$$

где V_{ϕ} – скорость фильтрации топлива, м/с.

Поверхность фильтрации можно представить следующим образом:

$$F = 2 * \pi * r_1 * h_{\text{эл}}, \text{ м}^2 \quad (15)$$

Подставим выражение (14) в формулу (15) и определим высоту водоотделяющего элемента:

$$h_{\text{эл}} = \frac{Q}{2 * \pi * r_1 * V_{\phi}}, \text{ м} \quad (16)$$

Таким образом, габаритные размеры водоотделяющего элемента зависят от пропускной способности и скорости фильтрации: чем выше пропускная способность, тем больше высота элемента, а с увеличением скорости фильтрации наблюдается обратная зависимость.

Следовательно, высоту водоотделяющего элемента необходимо выбирать таким образом, чтобы элемент имел минимально допустимые габариты, при этом обладал высокой эффективностью обезвоживания при допустимой скорости фильтрации и обеспечивал необходимую пропускную способность [2].

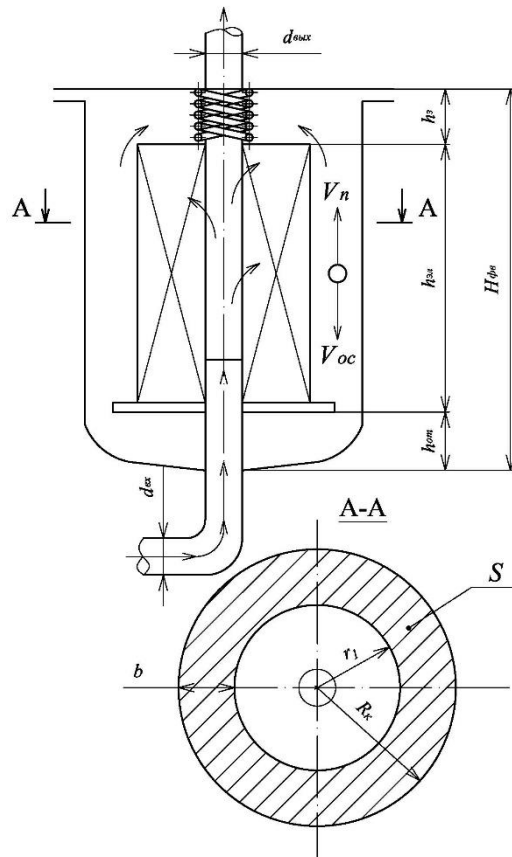


Рисунок 2 – Схема расчёта конструктивных параметров фильтра-водоотделителя [12]

Высота зазора между крышкой и водоотделяющим элементом выбирается такой, чтобы в нём обеспечивался ламинарный режим потока топлива.

Для этого необходимо, чтобы площадь зазора между крышкой и элементом была равна площади кольцевого зазора между элементом и корпусом, то есть должно выполняться условие:

$$S_1 \geq S_k, \text{ м}^2 \quad (17)$$

где S_1 – площадь зазора между крышкой и элементом, м^2 .

После преобразования формулы (18) получаем следующее неравенство [2, 3]:

$$2 * \pi * r_1 * h_s \geq \pi * (R_k^2 - r_1^2), \text{ м}^2 \quad (19)$$

Тогда высота зазора может быть определена по формуле [19]:

$$h_s \geq \frac{r_1}{2} * \left(\frac{R_k^2}{r_1^2} - 1 \right), \text{ м} \quad (20)$$

Объём отстойной зоны ФВ определяют исходя из условия обеспечения накопления критического объёма воды в течении одной рабочей смены трактора или автомобиля, работающего на топливе, содержащем свободную воду, то есть [2, 3]:

$$V_{отс} \geq x * G, \text{ м}^3 \quad (21)$$

где x – максимальное содержание свободной воды в топливе, %; G – количество топлива, потребляемое за смену, м^3 .

Для определения высоты отстойной зоны преобразуем формулу (21) следующим образом:

$$\pi * R_k^2 * h_{отс} \geq x * G \quad (22)$$

Откуда высота отстойной зоны равна:

$$h_{отс} \geq \frac{x * G}{\pi * R_k^2}, \text{ м} \quad (23)$$

Таким образом, общую высоту ФВ можно определить по формуле [3]:

$$H_{фв} = \frac{r_1}{2} * \left[\frac{R_k^2}{r_1^2} - 1 \right] + \frac{Q}{2 * \pi * r_1 * V_{\phi}} + \frac{x * G}{\pi * R_k^2}, \text{ м} \quad (24)$$

Анализ формулы (39) показывает, что высота ФВ зависит главным образом от размеров водоотделяющего элемента, а также объёма отстойной зоны. Объём отстойной зоны зависит от содержания свободной воды в топливе, наличие которой определяется условиями эксплуатации, хранением топлива и т.д. Следовательно, основным резервом уменьшения высоты ФВ является определение оптимальных конструктивных параметров водоотделяющего

элемента, обладающего необходимой эффективностью обезвоживания топлива.

Диаметр и длина топливопроводов.

Диаметр и длину топливопроводов определяют из условия обеспечения заданной пропускной способности через ФВ. При этом необходимо, чтобы в топливопроводе имело место ламинарное течение топлива, так как в этом случае гидравлические потери напора значительно меньше, чем при турбулентном режиме [13, 14].

Это особенно важно при установке ФВ на линии всасывания, так как в этом случае он имеет небольшой ресурс работы, определяемый перепадом давления на водоотделяющем элементе [2].

Таким образом, основной задачей расчёта является подбор оптимального соотношения диаметра и длины топливопровода, с целью снижения гидравлических потерь напора, то есть:

$$h_f = f(d, l) \rightarrow h_{f \min} \quad (25)$$

где h_f – гидравлические потери напора, кПа; d – диаметр топливопровода, м; l – длина топливопровода, м.

В общем случае для участка топливопровода гидравлические потери определяют по формуле [13]:

$$h_f = h_i + \sum h_j, \text{ кПа} \quad (26)$$

где $\sum h_j$ – местные гидравлические потери напора, кПа; h_i – гидравлические потери напора по длине, кПа.

Местные потери в топливопроводе на линии всасывания (от бака до топливоподкачивающего насоса) для общего случая можно определить по формуле [3]:

$$\sum h_j = h_{p.c.} + h_{p.p.} + h_{p.пов.} + h_{n.пов.}, \text{ кПа} \quad (27)$$

где $h_{p.c.}$ – гидравлические потери для резкого сужения, кПа; $h_{p.p.}$ – гидравлические потери для резкого расширения, кПа; $h_{p.пов.}$ – гидравлические потери для резкого поворота топливопровода, кПа; $h_{n.пов.}$ – гидравлические потери для плавного поворота топливопровода, кПа.

Гидравлические потери для каждого случая определяются по следующим формулам [14]:

$$h_{p.c.} = \zeta_{p.c.} * \frac{V_n^2}{2 * g}, \text{ кПа} \quad (28)$$

$$h_{p.p.} = \zeta_{p.p.} * \frac{V_n^2}{2 * g}, \text{ кПа} \quad (29)$$

$$h_{p.пов.} = \zeta_{p.пов.} * \frac{V_n^2}{2 * g}, \text{ кПа} \quad (30)$$

$$h_{n.пов.} = \xi_{n.пов.} * \frac{V_n^2}{2 * g}, \text{ кПа} \quad (31)$$

$$V_n = \frac{Q}{S} \quad (32)$$

где $\zeta_{p.c.}$, $\zeta_{p.p.}$, $\zeta_{p.пов.}$, $\xi_{n.пов.}$ – коэффициент сопротивления соответственно, для резкого сужения, резкого расширения, резкого поворота и плавного поворота топливопровода; S_m – площадь поперечного сечения топливопровода, м².

Анализ выражений (28-32) показывает, что на величину гидравлических потерь оказывает влияние скорость потока топлива в топливопроводе, при увеличении скорости потери возрастают в квадратичной зависимости. При увеличении диаметра топливопровода скорость потока уменьшается. Таким образом, для снижения местных гидравлических потерь необходимо увеличивать диаметр топливопровода [3].

Величина потерь напора по длине топливопровода определяется по формуле:

$$h_i = \lambda * \frac{l}{d} * \frac{V^2}{2 * g}, \text{ кПа} \quad (33)$$

где λ – коэффициент гидравлического трения.

Коэффициент гидравлического трения зависит от режима течения топлива [14]:

- при ламинарном:

$$\lambda = \frac{64}{Re} \quad (34)$$

- при турбулентном:

$$\lambda = \frac{0,3164}{Re^{0,25}} \quad (35)$$

Число Рейнольдса определяется по формуле [14]:

$$Re = \frac{V * d}{\nu} \quad (36)$$

где ν – кинематическая вязкость топлива.

Анализ выражений (33-36) показывает, что величина гидравлических потерь напора по длине зависит от длины и диаметра топливопровода. При увеличении его длины потери возрастают, с увеличением диаметра – уменьшаются. Следовательно, методом подбора оптимального соотношения диаметра и длины, можно снизить гидравлические потери напора по длине [2].

Полученные зависимости могут быть использованы для расчёта конструктивных параметров фильтров-водоотделителей для дизельных двигателей любого типоразмера.

4. Исследование характеристик многослойных коагулирующих перегородок

Планирование эксперимента для исследования гидравлических и коагулирующих характеристик многослойных коагулирующих перегородок изложены в [15, 17].

Выводы:

Impact Factor:

ISRA (India) = 1.344	SIS (USA) = 0.912	ICV (Poland) = 6.630
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1. Теоретические исследования обезвоживания дизельных топлив при помощи метода гравитационного показали, что для удаления капель воды с размерами менее 50 мкм требуется довольно длительное время [5].

2. Капли с размерами 20 мкм сохраняются в топливе во взвешенном состоянии в течение 10 часов и более, с размерами менее 10 мкм – более 2 суток [5].

3. Теоретический анализ механизма обезвоживания топлив методом фильтрации показал, что существенное влияние на эффективность водоотделения оказывают поверхностные свойства материалов,

структурный состав коагулирующей ступени фильтра-водоотделителя, толщина и плотность перегородки.

4. На основании теоретического анализа механизма обезвоживания топлива, обоснованно выбирались уровни и интервалы варьирования факторов при проведении экспериментальных исследований.

5. Формулы определения конструктивных параметров фильтра-водоотделителя могут быть использованы для расчета фильтров-водоотделителей любого типоразмера.

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SECTION 23. Agriculture. Agronomy. The technique.

RESPONSE OF LOCAL APPLE TREES TO SPRAYING WITH GROFALCS ,STAVALS AND TALL-PROLONG ON PHYSICAL AND CHEMICAL CHARACTERISTICS OF FRUITS

Abstract: This study was carried out on privat orchard at AL-Abbasyia . Najaf for season 2014 on the local apple fruit cv. Sharaby. The trees were spraying with three concentration of Grofalcs (200 , 300 and 400) mg / L , Stavals (100 , 200 and 300) mg / L and Tall-Prolong (1,2 and 3)% after 60 days from full bloom stage . Fruits were picked after 95 days from full bloom . The result indicated that leaf aria, total chlorophyll, shoot length, length, diameter, weight, firmness, Calcium pictate and humidity of fruits in creasing with increase concentration of Grofalcs, Stavals and Tall-Prolong. Also reduced percentage of fruit drupe, percentage of cracking, T.S.S , acidity and Vitamin C of fruits in maturity stage. There was significant differences between these treatments. The concentration of Grofalcs 400 mg /L gave the best results on length, diameter, weight, firmness and cracking of fruits for the season of treatment respectively.

Key words: Grofalcs, Stavals and Tall-Prolong, physical and quality of apple fruits .

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Introduction

AL-Hamdawi [10] found that spraying trees of fig cv. Waziri with Grofalcs at conc. Of 250 mg/L at 15 march for the tow growing seasons caused a significant increase total chlorophyll in leaves, total yield of tree, total soluble solids, vitamin C, and fruit firmness and decrease in fruit fall, fruit cracking percentage compared with control treatment. AL-Shmery [7] noticed that , spraying the local apple trees cv . Red summer with three concentrations of NAA(50, 75 and 100) mg / L , GA3 (100, 125 and 150) mg / L after 50 days from full bloom stage and picked fruits after 120 days from full bloom, there was a significant indicated that length, diameter, weight , firmness and humidity of fruits increased with increase concentration of NAA, GA3, also these treatments reduced the percentage of cracking, dropping , T.S.S , acidity and Vitamin C of fruits. AL – Ebraheme [3] noticed that , spraying apple c.v. Read summer tress with two concentration of NAA (25 and 50) mg/L, and castor oil (2 and 4)% and combination treatment between them produced increasing significant in the moisture peels, pulp,

juice percentage and reducing the cracking, T.S.S, acidity, anthocyanine on peels and vitamin C in juice during fruits ripening . AL – Noumani [12] found that spraying local apple after 50 days from full bloom with Grofalcs at conc. of (200, 300 and 400) mg/L led to reduction in percentage of fruit dropping and cracking and increased total soluble solids , total sugar , vitamin C and firmness at ripening . Singh [16] noticed that , spraying pomegranate trees with GA3 solution conc. of 200 mg/L demonstrated effectiveness in reducing fruit cracking and caused an increase in leaf total chlorophyll contents , total carbohydrates percentage in fruits , fruits firmness, and a decrease in fruit cracking percentage compared to control treatment. Byers and Carbough [13] found that , the addition of GA3 150 mg/L to apple trees cv. Styman has reduced the proportion of fruit cracking to 7% compared with 26.0% in the fruit of control treatment. Al- Dulaimi [2] stated that , spraying pomegranate trees cv. Salami by GA3 at conc. of 200 mg/L three times on 1996 and 1997 growing seasons, the interval between sprays was 30 days started from June at maturation , there was a significant decline in



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the proportion of fruit cracking for the medium concentration of the above nutrients as well as, increased constant of fruit epicarp of these nutrients compared with control treatment. AL- Rawi [4] noticed that, the spraying of GA₃ concentration (50 and 100 ppm) on fig trees cv. Aswod Diala at depressed period reduced the proportion of fruit cracking and increased the firmness, leaf area, total chlorophyll, percentage of carbohydrate. Abo – Zaid [1] mentioned that, spraying of GA₃ at conc. of (100 and 150 ppm) on pear trees in Egypt has increased the vegetative growth and fruit firmness. This present study came to be a series of scientific research to assess spraying of Grolfals, Stavals and Tall-Prolong on physical and chemical characteristics of local apple fruits cv. Sharaby during ripening.

Materials and methods

This study was conducted in a private farm at AL-Abbasyia, Najaf governorate for the 2014 season on apple trees cv. Sharaby, 30 at same size and growth trees were selected with 15 years of age, that planted on (5 x 5 m.), they were spraying with three concentration of Grolfals (It were discs of GA₃ 50% from the production of Green river company, India) (200, 300 and 400) mg/L, Stavals (It were discs of (Beta Naphthoxy acetic acid) 50% from the production of Green river company, India) (100, 200 and 300) mg / L and Tall-Prolong (Material wax contain Etokscouine 10% + di-2-p-menthenne 90%) (1,2 and 3)% after 60 days from full bloom stage. The trees watered every five days, and fertilized by Nitrogenous and phosphatic in two periods in March and May of each year at a rate of 500 g. per tree, as well as by manure for the two years. The experiment included 10 treatments with three replicates. It is adopted according to Randomized Complete Block Design (RCBD), and the results were statistically analyzed according to LSD test at the probability level of 5% [5]. Trees spraying was done early morning until wetness was full addendum. Tween 20 was added at conc. of 1cm³/L as spreader material. Ten normal fruits were taken at random after 95 days from full bloom from each tree for quality determination. leaf area cm², Total chlorophyll mg / 100g dray weight, Shoot length cm, % Fruit drop, Length of fruit (cm), diameter of fruit (cm), weight of fruit (gm) and percentage humidity of fruits according to [8]. Firmness was measured on two sides of each fruit with an Effegi penetrometer (Model NI, McCormick Fruit Tech, Yakima, WA) Fitted with an 11.1mm tip. The percentage of cracking were calculated during the months of Jun and July for season according to [11]. The total soluble solids were determined by hand refractometer. Total acidity % and Vitamin C mg /100 ml Juice according to [15]. Calcium pectate was determined according to [17].

Results and discussion

1-Effect of spraying with Grolfals, Stavals and Tall-Prolong on leaf area, total chlorophyll, shoot length, length, diameter, weight, firmness, Calcium pectate and humidity of fruits.

Spraying with Grolfals, Stavals and Tall-Prolong led to increased in the leaf area, total chlorophyll, shoot length, length, diameter, weight, firmness, Calcium pectate and humidity of fruits significantly compared to control treatment until reached highest rates (32.98 cm², 118.75 mg / 100g dry weight, 14.22 cm, 5.93 cm, 4.93 cm, 90.08gm, 9.15 kg/cm², 3.99%) in the treatment Grolfals 400 mg / L in comparison to the lowest values (26.12 cm², 113.21 mg / 100g dry weight, 10.18 cm, 4.29 cm, 3.40 cm, 85.76 gm, 8.32 kg/cm², 85.90 % and 2.96%) in control treatment, respectively. The highest rates of humidity of fruits in the treatment Tall-Prolong 3% it was 87.44 % (Table 1 and 2). The increase in leaf area, total chlorophyll, shoot length, length, diameter, weight, firmness, Calcium pectate and humidity of fruits because of the treatment of Grolfals, Stavals and Tall-Prolong due to the fact that auxins and gibberellins work as center to aggregation nutrient materials and enhancing the speed of transferring materials from leaves to fruits [9]. The increase in firmness in fruits due to spraying trees with auxins and gibberellins because these treatments plays an important role in strengthening the cell walls through its role in enhancing pectin coherence which increases the thickness of cell walls, which makes it more strength and stiffness to resist pectin analysis enzymes [13]. Besides that increasing in the fruit length, cell size, leaf area, total chlorophyll were obtained due to the treated effect. This act leads to enhance the photosynthesis process and transfer materials to fruits and in large increase in total growth. The waxed materials leads reduction in fruit respiration which finely lead to decrease the stored materials in fruits [14, 6].

2- Effect of spraying with Grolfals, Stavals and Tall-Prolong on percentage of fruit drupe, percentage of cracking, T.S.S, acidity and Vitamin C.

Data in Table (1 and 2) shows that percentage of fruit drop, percentage of cracking, total soluble solids (T.S.S), acidity and Vitamin C, in fruits were decreased insignificantly when trees sprayed with Grolfals, Stavals and Tall-Prolong. The highest significance result were recorded in control treatment, that gave the highest percentages of fruit drop, percentage of cracking, total soluble solids, acidity and Vitamin C, they were (17.43 %, 10.56 %, 11.80%, 1.07 % and 7.55 mg / 100 ml Juice) comparison with least rates of percentages of fruit drupe and percentage of cracking (6.68% and 2.95) in Stavals 300 mg / L and Grolfals 400 mg / L treatments respectively. The least rates of percentages total soluble solids, acidity and Vitamin C, they were (11.20 %, 17.70 %, 0.80 % and 7.01 mg / 100 ml

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Juice) in control treatment, respectively. The decreasing in the fruit dropping percentage due to auxins spraying could be attributed for prevention cell wall middle lamella analysis in abscission zone through decreasing the action of ethylene, peroxidase and IAA- Oxidase enzymes which resulted in the physiological analysis occurring to the cell wall. Meanwhile the decreasing in cracking percentage due to gibberellins spraying could be attributed to the increase in plasticity and elasticity of fruit peel

that carried on with internal fruit growth, besides, its role in cell extension and increasing photosynthesis products that has big necessary importance in building cell wall, and strength to protect fruit from [13]. The reduction in total soluble solids, acidity and Vitamin C due to the sprayed with Grofalcs, Stavals and Tall-Prolong return to the increase in the percentage of fruit water contents which intern reducing the concentration of materials in fruit juice.

Table 1
Effect of spraying with Grofalcs, Stavals and Tall-Prolong on physical and chemical characters fruits of local apple cv. Sharaby for season 2014.

Treatments	leaf area cm ²	Total chlorophyll l mg / 100g	Shoot length cm	% Fruit drop	Length of fruit cm	Diameter of fruit cm	weight of fruit gm
Control	26.12	113.21	10.18	17.43	4.29	3.40	85.76
Grofalcs 200 mg / L	28.34	114.90	11.29	14.19	4.95	4.70	87.55
Grofalcs 300 mg / L	31.56	116.59	13.78	10.67	5.20	4.87	90.08
Grofalcs 400 mg / L	32.98	118.75	14.22	8.55	5.93	4.98	93.25
Stavals 100 mg / L	28.11	114.43	10.87	13.20	4.38	4.65	86.90
Stavals 200 mg / L	29.70	115.36	11.09	9.32	4.53	4.79	87.65
Stavals 300 mg / L	31.24	115.90	11.45	6.68	4.90	4.85	88.99
Tall-Prolong 1%	26.90	113.84	10.50	16.21	4.34	4.53	87.00
Tall-Prolong 2%	26.98	113.93	10.48	15.00	4.38	4.55	86.40
Tall-Prolong 3%	26.97	113.95	10.61	15.36	4.40	4.54	86.96
L . S . D . 0.05	0.54	0.61	0.23	1.20	0.79	0.36	2.12

Table 2
Effect of spraying with Grofalcs, Stavals and Tall-Prolong on physical and chemical characters fruits of local apple cv. Sharaby for season 2014.

Treatments	firmness of fruit kg/cm ²	% cracking	% humidity of fruits	% Total soluble solid	Acidity	Vitamin C	% calcium pictate
Control	8.32	10.56	85.90	11.80	1.07	7.55	2.96
Grofalcs 200 mg / L	8.50	7.15	86.81	11.30	1.01	7.18	3.59
Grofalcs 300 mg / L	8.53	6.22	86.96	11.12	0.93	7.15	3.82
Grofalcs 400 mg / L	9.15	2.95	87.23	10.93	0.87	7.02	3.91
Stavals 100 mg / L	8.49	8.37	86.49	11.40	0.98	7.14	3.17
Stavals 200 mg / L	8.52	6.60	86.74	11.31	0.85	7.10	3.19
Stavals 300 mg / L	8.61	6.03	86.95	11.25	0.81	7.07	3.54
Tall-Prolong 1%	8.50	8.19	86.90	11.39	0.97	7.16	3.00
Tall-Prolong 2%	8.64	6.50	87.19	11.27	0.88	7.10	3.15
Tall-Prolong 3%	8.70	3.83	87.44	11.20	0.80	7.01	3.28
L . S . D . 0.05	0.15	2.09	0.95	0.11	0.06	0.08	0.22

Conclusion

It could be concluded from this experiment that, spraying trees with Grofalcs, Stavals and Tall-Prolong led to increased the leaf area, total chlorophyll, shoot length, length, diameter, weight,

firmness, Calcium pictate and percentage humidity of fruits. Also reduced percentage of fruit drop, percentage of cracking, T.S.S, acidity and Vitamin C of fruits in maturity stage compared with control treatment.

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SECTION 30. Philosophy.

GLOBAL PROBLEMS: HISTORICAL FORECASTING AND NECESSITY OF DEVELOPING OF THE PUBLIC OPINION

Abstract: *On basis of historical analyses in this article discovered threats that getting to human evolution and nature stability that happening from genesis the forming global problem and happening among escalating process of functional integration. Also offered planned way and recommendation on human habitation and achieving consistent development of nature.*

Key words: *public opinion, global problems: demographic explosion, provision, power industry, production, deficit of water, ecological crisis, clash of Civilizations, functional integration.*

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The reality of 21st century is relations between opinions, doctrines, concepts of people, nations, states and humanity on life, are very complicated, even it is conflicting in some cases. That's why nowadays we can feel the urgent necessity for developing matter of public opinion on Global problems, and the urgent necessity for scientific research. Because by developing the public opinion it is possible to provide all the people living on the Earth with comfortable and secure life. On this matter scientific research in large scale has begun in western countries since 80s of last century. But current problems do not still lose their importance.

Marks of the problem:

Nowadays it is clear that global problems and forecasting tendencies which aimed to solve these problems are in the centre of the public opinion. Because new increasing natural and artificial problems leading to the unsafe place to live, makes humanity to worry about. Today as a result of high developing of world science and technology, natural resources are used more as ever in everyday usage. Besides these, increasing the population of the world year by year requires to produce much food, oil, clothes and others as well. All these cause decreasing the area of forests, spreading the wide deserts, spoiling the ground, widening the holes of ozone layer above the atmosphere, rising the average temperature of the Earth and est [1, 100].

We know that the health of human being is the supreme. Today, one of the factors that could cause serious harm to human health is a problem related with water. So that, we can say that Water War is possible in 21st century. Because in the lecture of 'Global Water Security published in 2012, American analysts mentioned that for the next 10 years 'Water instability in the world' will appear and water sources can become an instrument of pressure. On this issue Hillary Clinton, a former State Secretary of the USA said that the population of the world is growing. Thus, the demand for water increases, and appearing problems, of course, increases the risk of instability between countries and within countries, too. There are some reasons to cause regional instability related with water in the near future, and those reasons are followings: 97.5 percent of all the water reserves in the Earth is salt water; fresh water available for human life is only 2.5 percent. If we take into account that their 75 percent is mountain and polar ices, 24 percent is subsoil waters, 0.5 percent is moisture in the soil, easy to use and the most inexpensive fresh water is in the lakes, rivers, underground water and other water sources. They made up 0.01 percent of total water resources of the world.

According to the statistics 3.8 thousand cubic water have been used by people every day, according to the calculations of scientists, fresh water reserves will seriously decline next 25-30 years. To be more



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precise, fresh water reserves will be used up by 2100, all fresh water reserves of the Planet will end completely by 2230 [2, 148]. Because according to the latest estimates, nowadays 70 percent of the fresh water consumed in agriculture, 20 percent in industrial production, 10 % in domestic consumption. In the beginning of 21st century the need for clean drinking water around the world is increased 2-3, 2-5 [3] times than 1990's. If the need for drinking water increases in this way, 90 percent of drinking water reserves will be expected to allocate in agriculture by 2050. As you know, some countries have already finished their water resources. Sadly, by appearing problem not only nature, but the man being has also been suffering most. For example, according to the data of UN Environmental Protection Program, half of the world's rivers are seriously polluted now. 40 percent population of the Earth is suffering from a lack of clean drinking water. Because of the lack of clean drinking water 1.2 million people will be exposed to a variety of diseases every year, 5 million people are drinking the water with poor quality and polluted water.

World statistical data shows that by the years 2020-2025, all fresh water resources will be taken for human activity, and fresh water can be the source of investment, and it is likely to be sold. If we take into account that during the last 100 years around the World water consumption had an increase of six times, by 2050 people will need for two times much water than nowadays. Unfortunately, the water sources are decreasing rapidly. Now 1.1 billion people around the World are constantly struggling with water shortages. More than 2 billion people are faced with this problem from time to time. This figure represents almost half of the population of the Planet have fresh water scarcity risks. The most worrying aspect is that, every day, 6,000 people (mostly children) die due to this problem or its consequences. It is forecasting that 500 million people may migrate to other continents looking for fresh water by 2030.

One of the universal problems which has been required to meet human needs constantly is a problem of food. Today we know that, providing very fast-growing world population with food in many regions of the world in recent years is not good. For example, due to malnutrition nearly 11 million children under the age of 5 pass away every year in the world [2, 203]. As a result of measures to mitigate this situation, the development of reserves growth, on the one hand, widening the agricultural land, on the other hand, increasing the productivity of arable land, has been provided by. In the recent years, many activities have been carried out to increase the productivity, including it was reached that the risk of the food crisis has been decreased by increasing the global harvest productivity till 90 percent in 1980s [3]. However, to achieve such

success might cause to destruct any natural balance. Because as a result of solving the food crisis, a lot of land was degraded, in other words, the natural environment is being destroyed by the pressure of man. The most dangerous aspect of the problem is there is no any opportunity to return to the land's natural position. Such a dangerous situation came out because of the followings; first of all, the natural growth process developed at a very fast pace; secondly, to meet their needs for jobs and food products. In fact, Thomas Robert Malthus, the English economist forecasted about the origin of this problem in 18th century. In his book 'An Essay on the Principle of Population' he wrote that if we did not prevent the increase in the population by geometric profession, in the near future in the planetary scale, the natural environment, which may be material with a good amount of conflict between the needs of the rapidly growing world population may occur [4]. Malthus' predictions are reflecting in full power in practice.

Today, the environmental situation is counted one of the global problems which depends on the health of man. Because a violation of the ecological balance is not only current problem of man, but the problem is directly related to the future of the planet, too. One example, according to the UN data, 80-85 billion tons of fuel combustion id used on the planet in the history of man till now. The half of that amount is used last 25 years. 2 billion tons of coal is burned per year [5, 207]. At present, 15 billion tons of gas and dust is adding to the atmosphere in the result of burning a variety of fuels, including natural gas, combustible shale, peat, wood, forest fire, the volcanic eruption. According to the academic A.P.Vinogradov, in 2200 the amount of carbon dioxide in the atmosphere will be increased to 20 percent comparing today. Before the start of the revolution in science and technology the amount of carbon dioxide in the atmosphere was in balance for a long time. Because by photosynthesis plants have been processing 110 billion tons, or 5 percent carbon dioxide in the atmosphere. If the Atmospheric pollution increases in this rate, what consequences the mankind will face with in the future? It is natural that such questions will make any person to think about seriously. Because the changes in the atmosphere produces a range of global issues for humanity. In particular, average temperature of the World rose by 0.74° C over the last 100 years. Experts on climate change are warning that the global ocean levels may rise 20-50 centimeters as a result of active melting of the glaciers in Antarctica and Greenland until 2100, and it cause the flood in the many island states and coastal cities. Because according to the report 'Climate Change 2007' prepared by the Intergovernmental Commission of UN, the temperature of the Earth may increase from 1.4 to 3.8° C the next 100 years. [6, 3] Besides

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these, today one of the worrying situations is that the ozone layer, which protects the Earth from harmful gases, has been removing as a result of the increase of gas emissions to the atmosphere. In other words, the part of atmosphere located at an altitude of 15-25 km above the Earth level is called as an ozone layer, it is known as the ozone screen, too.

The ozone layer receives ultraviolet rays from the sun, and protects all living organisms on the Earth from the harmful effects of ultraviolet rays. There are many factors to deplete the ozone layer, but a self-restoration process of nature prevents the ozone layer over from its gradual depletion. Natural equilibrium is being destroyed by the aggression of man. The most worrying aspect of it is that the opportunities created by the human hand produce the instability in the nature; on the other hand, it leads man to fall into a decline. There are some bases for those thoughts. For example, some industrial networks receive a large amount of oxygen from the atmosphere, while they produce different gases and substances. To produce a ton of iron from ore 150 m³ oxygen, a ton of steel 35-70 m³ oxygen, and a ton of ammonia 500 m³ oxygen and a ton of acetylene 3600 m³ oxygen is used. In recent years the demand for oxygen to get steel increased 2.6 times and in blast furnaces it increased by 4.2 times. In general, the oxygen is being used five times more in industry last five years. Which is more important for mankind 'wealth' or 'life'? Another example, according to the data, 70 – 80 percent air pollution is because of vehicles. Y.V.Novikov said that automobiles pollute the air by producing more than 200 different aerosol particles. Each car 200 kg (mainly gasoline) and 300 kg of air is used. By consumption that fuel a car produces 700 kg of carbon dioxide, 230 kg of carbohydrates, 30 kg of nitrogen oxide and 2-5 kg of solid substances into the air [7, 121].

In conclusion, man is leading the Planet on which he lives himself to the catastrophe, and he is doing it consciously. Because human can live with poor suffering health for years, without food for months, without drinks it is available for a week. If there is no any oxygen for breathing, man will not be able to live even for a moment. And man still does not want to understand that.

For example, nowadays the USA is not only one of the leading industrial countries of the world, but it is one of the leading countries using oxygen much more than other countries, too. All plants in the USA are not able to provide such amount of oxygen that is used by industry, transportation, population and the fauna in the country. That's why, today the USA lives at the expense of clean air of other countries.

On the one hand man makes problems connected with food, water and oxygen to survive, but on the other hand, man makes the Earth unsuitable to live on. But we are responsible to

supply the future generations with pure nature. It may cause not only person's self-destruction, but it may lead mankind to extinction as the descendants of the dinosaurs, too. For example, today thousands of hectares of grounds have been used for the expansion of cities; the construction of industrial enterprises. So many forests are being cut off, and green land is decreasing. This trend is very dangerous, especially in developing countries. About 0.8 percent of tropical forests are disappearing each year, 200 thousand km² tropical forests are cut, and it is renewable. Currently 8.3 million hectares or 16 hectares of forest is being cut per year [3]. In a word, winner over the nature is not man, but the technology created by man. We should not forget that the technology needs mankind to create the existence of the future generation. In addition, for the last 25 years 45 percent of coal, 57 percent of iron ore, 76 percent of oil, 80 percent of natural gas is produced from the beginning of the twentieth century to the present day. This figure can be observed in other types of raw materials. For example, in 1990s the production of raw materials' amount increased 1.5-2 times comparing to the 1960-70s, and now it has increased 2.2 times [3]. Appearing of that situation can cause the tension in raw-material resources which are important for mankind; and have resulted in a reduction of fertile land and drinking water sources. One more important point is that the environmental situation and a violation of the natural environment will affect to the human body and his activities of production.

As one of the factors which have been leading to the destruction of mankind, we can show the decline in energy and fuel resources. Because need for energy of the industry and national economy has deteriorated as a result of increasing energy consumption. We know that energy determines the pace of development of the world economy. According to data, in the next few years the demand for energy and fuel resources will be 20 billion tons; by 2025 it will be 35-40 billion. By the end of 21st century it will be 80-85 billion tons. This process shows that a serious conflict between man and natural resources in recent years is possible. It should be emphasized that the natural resources, which are used for their own needs, are not infinite. In other words, if the development of man and nature is not functionally integrated, man will face with the most significant and irreversible damage. As Professor Sayd Mamashokirov said, the current generation's fortune gained by harming the ecology of biosphere is the beginning of misfortune for future generations.

Misunderstood aspect of the human race is that man leads himself and his future towards the destruction, on the one hand, man is trying to continue reproduction. In fact, all of the above-mentioned problems are directly related to demographic changes. Historically, we know that the concept of 'Demographic bang' is reflected since 20th

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century. The notion of ‘Demographic bang’ means a rapid increase of the birth rate amount in the short period of social and historical development in a particular region or country, and also, the population of the Earth is growing very fast. By occurring this process, food shortages, water scarcity, environmental pollution, and the renewable balance of nature, environmental crises and other problems are developing today. As information, according to some experts, the energy, raw materials, food and other resources in the Planet are enough only for one billion people to live a decent life. It means that the population of the USA, Europe and Japan is equal to that amount. For this reason, some analysts are trying to name these countries as ‘The golden billion’. These countries use more than half of the energy and 70 percent of the metals. And the most important point is that they produce 75 percent of the waste. Particularly, the US uses 40 percent of the world's natural resources, and 60 percent of pollution has been made in this country.

According to the specialists, if other countries also use the natural resources as the US does, probably world's oil reserves will end in 7 years, natural gas in 5 years, coal in 18 years. The worrying aspect of the problem is that the process of ‘Demographic bang’ is increasing, while the world's natural reserves are declining. For example, at the beginning of 20th century 1.5 billion people lived on the Earth, in 1950 population grew 2.5 billion people in spite of the World War II, and it increased for 70-100 million people every year. In 1993 it was 5.5 billion people, it shows that population has increased two times higher than in the middle of the last century. According to the UN data, On July 11, 1987 a five-billionth-baby was born. Sixth billion was in the year of 1998. At present time every year 130 million people are born, that the 50 million people die, thus the population has been increasing about 80 million people every year. About 6.5 billion people [2, 180] live on the Planet now. If the population growth continues in the same way, it will be 14 billion by 2050-2070 [8, 20]. In a word, man is leading himself towards recession.

Researches aimed to solve the problem:

A mankind is counted as a driving mechanism of organizational, formational and developing stages of all above mentioned problems. So, today only man is unique solution for all problems of global importance, because of man there are so many problems. We should develop the public opinion that only man can defeat all these issues. That is very important. There are some international organizations which are responsible to identify the factors and of course the causes of the current and new problems; and these organizations try to develop the public opinion against these issues and try to focus on the international scale. For example, The Club of Rome is one of the organizations, which

studies the causes of the global problems in scientific-theoretical and practical principles. The main function of this organization is that it aimed to guide the international community to solve the current global problem. In other words, developing the public opinion, which directed to eliminate the factors and the origin of the problems in the global importance, is the main objective of The Club of Rome. One of the main tasks of this prestigious international organization is to prepare and publish the most important reports on global human problems. ‘The Limits to Growth’, the first report of the organization, published in 1972, was the very popular. We should note that the number of all reports prepared by the Club of Rome is more than thirty today. In the preface of ‘The Limits to Growth’ the founder of the Club of Rome Aurelio Peccei said: ‘Now none of the healthy minded person do not believe in that our Earth is not able to endure the growth rates and any erratic habits of mankind. It is obvious that Growth has its limits, but we need to identify where and how’ [9, 123-124].

We know that the formation, development, and eventually eliminating of any problem is directly connected with the level of the development of public opinion. The Club of Rome understood this principle correctly, so it got great reputation in the first publication. The reports prepared by Jay Wright Forrester, Donella Meadows, Jan Tinbergen Alexander King and others, the members of the Club of Rome, have great scientific importance in developing the public opinion on serious scientific prophecies about the future prospects of civic society. In the reports serious considerations, in which written about terrible consequences of pressure and attack to the nature by man; and expanding the global problems which might be very dangerous for the future prospects, are written. The prophecies by the members of the Club of Rome were in scientific and philosophical nature, and in these prophecies we can see the important scientific conclusions about the future of mankind. And the conclusions were mainly based on the categories and the laws of logic; and practice on tested knowledge. In a word, in defining the future prospects of human development, the most important characters include understanding of the nature of the global problems. Man should understand that all these problems can be resolved by corporative development of the public opinion in the way of global interests.

As noted, the Club of Rome could attract the public attention with its first report published in 1972. Because the report of the organization was prepared by approaching the scientific researches of great scientists of the world. The Report was based on the project ‘The Predicament of Mankind’ created under the rule of Donella Meadows at the Technological institute of Massachusetts (USA). The Club of Rome tries to explain the most important

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parts of these problems by the following attributes. First of all, the formation of public opinion on that the future problems facing in the beginning of 21st century are very complex and very important; secondly, creating the chances for survival of mankind, and the formation of new relationships aimed to prevent the possibility of the global disasters and est. The Club of Rome usually warns the human being about social consequences of economical, industrial, scientific-technical problems facing humanity in future, and by these the club aimed use the public opinion in solving the problems.

In 1991 the Club of Rome announced to the people of the world about the cooperation. The origin of the global problems of humanity, and issues on saving the mankind are widely analyzed in the report 'The First Global Revolution'. It was noted in the report that the international partner organizations should understand the seriousness of this issue, every person should be involved in this matter. 'We challenge for global cooperation', written in the report. In general, though as Donella Meadows and his colleagues stated 25 years ago: 'Humanity is moving towards the tragedy, it should be solved', these ideas have not lost their importance yet. It has already been global issue, and requires the formation of the wide public opinion which focuses on the real solution of problems.

Besides these, here we want to speak about the concept of academic N.Moiseyev, a famous Russian scientist, who has given special attention to the formation of public opinion focusing on solving global problems. The crisis of modern civilization and the ways out of the crisis are described in detail in Moiseyev's prospectus 'The Destiny of Civilization'. Moiseyev warned the humanity about that was the Planet was near to the unknown and the inevitable destruction ...; according to his ideas this destruction would be expected in not unknown future, but it might occur in the middle of 21st century, and he challenged the humanity for awareness and cooperation. In his opinion, there is only way to prevent this destruction, it is very necessary that everybody should feel himself as a part of nature; and the people of the world should know that the planet is the only home to live in; they should begin to live on the basis of civilization paradigm and moral principles. Зарурдир [10, 5-6]. By studying the thoughts of scientists we can understand a truth that it will be impossible to save the Planet, if we do not develop the corporative cooperation in the public opinion aimed at solving the problems that arose.

The Moiseyev group, which stated the formation of public opinion focused on solving the global issues, counted that economic, technical, technological, and intellectual support is very important in the solution of global problems on spiritual security. That's why, it is impossible to

solve the problems on social, spiritual security for countries separately, and the group is looking for the alternative way of development for humanity. According to the group members the conflicts of civilizations could be solved evolutionary as a result of creating an effective management of integration, cooperation, corporate interests, in other words, an effective control of public opinion. Moiseyev described that evolutionary process in the following. Today socio-political development practices of human being can prove that it led the society into a synergetic and complicated way. Billions of people on Earth is getting understand it time by time, and mankind is trying to change the development paradigm, and they are near to the evolutionary way of development. It is earth on face of resident milliardth men gradually to catch and humanity changing progress of paradigm, evolution development on a way expiration costs ahead [11, 48]. His ideas on possible zones of conflicts between civilizations have very critical importance.

Moiseyev wrote about the necessity of an important milestone in the history of mankind. And he said that humanity is on the threshold of the third major reconstruction. In his opinion, mankind should find not only a new wider ecological chain, but the process of anthropogenesis is to be restructured, too. Besides these, the contents of civilization, its objectives, the nature of bilateral relations, the relationship between the people should be changed. In order to get the implementation of this process, it requires following to the thought of the team, in other words, following to the public opinion is one of the most important and urgent tasks.

Ways to solve the problem:

The necessity of formation of the public opinion aimed to solve the problems of global importance can be explained by the following scientific-theoretical proposals:

First, civilization of society is an objective process that moving constantly. But the subjects, affecting the development of evolution in the way of their interests, destroy the natural gradualness, and the opportunity to restore them-selves has been deprived. The most worrying point of the problem is that the number second, third and other new problems are growing while current problem has not solved yet. The reasons to appear this situation could be related to different factors. For example, the well-known scientists and philosophers like Herbert Marcuse, Theodore Roszak, P.Goodman and other accused their predecessors on cruel scientism, accused them on trying to make man a slave of science and technology. And they opposed to the development of science and technology. As a result, a new wave of protest against the development of science, technology and social progress, appeared. Appearing ideas under the wave tried to prove anti-consumer society, and tried to persuade man to be

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patient with little content. They believe in that modern technologies were the main perpetrator in the process of trying to find a guilty on appearing the global problems. They had suspected not only in science, but the idea of progress. At that time Jean-Jacques Rousseau's challenge 'Return to nature' was popular, and they proposed that the level of economic development should be stopped. By comprehensive approach to the problem we can see that the humanity get civilized society because of social development, particularly, the changes in the human mind and consciousness. The main cause of this phase was the equipment and technology, and there will be neither future nor development without technology. The development of technology will serve for the future of mankind, if we can change instinct for self-protection in the mind of man to the skill of understanding and thinking of personal interests with public interests consciously. So, nowadays we should make conducting propaganda campaigns not among the scientific society, but it will be better if we can achieve wide conducting campaign among the common people. That's why, in the public opinion we have to develop the thoughts about consequences of terrible approach to nature. Because an approach to society will be proved theoretically, when we develop the approach to nature among the scientific society. And when we make conducting propaganda campaigns among the common people, an approach to nature will be proved practically.

Second, we can say with full confidence that it is very difficult to overcome the problems of the 21st century. In many cases, current problem becomes as in evolutionary stage of development, and as a result of it humanity will remain in the problem forever. For example, we can see those problems in the followings: water shortages, food shortages, a violation of the atmosphere, a decay of on-ground and underground resources, an aggravation of population growth, religious fundamentalism associated with social conscience, and of course, the terrorism which going to become combined with geopolitics. According to Aurelio Peccei, Many problems on the way of mankind have already combined tightly with each other. The problems make the world to suffer like a great octopus squeeze the whole Planet with its arms... the number of unresolved problems are increasing, they are becoming more aggravated, their difficultness are getting much more complicated, and our Planet is getting increasingly 'squeezed by the grip' of the problems [9, 7]. Thus, instead of struggling to remove the current problem, it will be much more effective, if we try to prevent it going to the next step. In order to get this aim, it is required to increase

the impact of ideological immunity and ideological education in the public mind. So, unless man tries consciously, there will be not result of any event or action.

Third, if humanity continues his rapid developing without taking into account the possibilities of nature and its laws of development, the socio-economic, environmental issues including: the land erosion, loss of forests, too much fish poaching, salty rains, air pollution, in violation of the ozone layer and disasters will increase on the Earth. The consequences of all these will be fatal for human being. That may make the life to die on the planet of Earth the only place to live for man. Nowadays none of us allow and forget such trends which getting manifested as a simple truth. In other words, it is necessary to achieve the unity of the nations of the world and the collective corporation. The only way to achieve such a result is widely developing of the public opinion focused on possible problems.

Fourth, in a word, it is possible to reduce the growth rate of the current problems, and weaken the progress of evolving into new forms as a result of the formation of public opinion against the existing problems.

To achieve such a result, public opinion should be focused on, especially:

— Preventing the shortage problem of oxygen which dear factor for human life;

— Preventing the shortage problem of drinking water which necessary for the survival of every living soul;

— Preventing the improper use of energy, food and natural resources problem which distorting the natural balance of the Earth;

— The most important point is that it is very necessary to develop the ideological immunity against the consequences of the result of Demographic Bang. Because the demographic bang is counted as an object of all global problems. Achieving that aim is required the development of approaching ethics and even the mind of every citizen of the Planet Earth. Because the progress of science and technology is developing at a rapid pace on the threshold of 21st century. Geo-political structure of the world is changing. In this condition the following are become increasingly urgent: the regulation of impact to the biosphere by man; the impact of the preservation of the natural environment with the social development; achieving the balance in interrelations of nature and man [1, 101]. Therefore, it is possible to achieve the ultimate stability as a result of developing the public opinion on importance of functional integrating phase between nature and man.

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SECTION 29. Literature, Folklore, Translation Studies.

BUSINESS CORRESPONDENCE STYLE AND FORMAT

Abstract: *The research provides an insight into effective business letter writing. The major types of business correspondence are singled out.*

The peculiarities and specific features of formal style, language and grammar usage are discussed.

The study presents essential rules of business letter writing and analyses the structure and the main components constituting business letters, as well as conventional formats of business correspondence.

Recommendations on effective business letter writing, formal style and language usage are given in the article.

Key words: *business correspondence, business letter, types of business correspondence, formal styles, business letter language and grammar, business letter clichés, abbreviations, structure and components of business letters, block format, semi-block format, indented format.*

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1. Introduction

Business correspondence is common and widely used in business communication and transactions. Successful and effective business letters assist the flow of information in a company or business environment. Business letters can enhance business contacts, benefit or detriment company performance, and influence the outcomes of negotiations. Effective letter writing is crucial to the success of every company or professional. Therefore, the research of business correspondence language and types is an urgent problem. It is essential to study the rules of business letter writing and single out the peculiarities and specific features of types, styles and structure of business letters.

Business correspondence (business letter) is an umbrella term for all written communication used in business relationships with business partners or for internal communication in the organization. The business correspondence includes all written correspondence in organizations such as personal documents, simple legal documents, personal letters, business contracts, marketing materials and official letters, both in electronic and paper form. Business correspondence includes Information Letters (Letter of Introduction, Letter of Inquiry, Letter of Confirmation, Letter of Notification, Apology Letter), Letters of Business Offer (Letter of Proposal,

Letter of Bid), Letters of Demand (Letter of Request), Letters of Claim or Complaint, Advertising and marketing materials (brochures, leaflets), Personnel Letters ([Curriculum Vitae \(CV\)](#) or Resume, Motivation Letter, Letter of Application, Cover Letter, Letter of Recommendations), Personal and Social Letters (Invitations, Congratulations, Announcements, Condolence Letters).

A distinct and unified idea behind the letter is the first requisite for giving it the hang-together quality and the punch that gets results. The idea cannot be conveyed to the reader unless it is presented logically. He won't get a single general impression from what you are saying to him unless there is unity of thought in the composition. The reader cannot follow the argument unless it has continuity, sequence of thought. And, finally alongside with logic and style, not less attention and efforts should be given to a strong conclusion. These five principles – the idea, logic, unity of thought, continuity, and conclusion – are the forces that hold the letter together and make it effective. These principles are not optional rules or academic theories. They are based on the actual experiences of men ever since they began to talk and write. All forms of communication, including business correspondence, most easily accomplish their purpose of arguing the communicative message or persuading the other



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man, if these major principles of writing are followed [5].

2. Style in Business Correspondence

The official business style is not homogeneous by its nature. It can be related to commercial, legal, administrative, international and social relations. Business speech functions in areas of production, trade, management, law, politics, social activity and international relations. Official business style can exist in written (business correspondence, legal texts, paperwork etc.) or oral forms (meetings, negotiations, interviews, presentations, speeches etc.).

The formal business style can be subdivided into some so-called sub-styles, including legislative, diplomatic, administrative-clerical. It is quite natural that all above mentioned sub-styles have their specific features, communicative forms and language clichés. The specific character of formal business communicative activity and conveyed information require specific structure of business texts. Formal business texts should have clear and unambiguous structure [8]. The paragraphs of business letters tend to be short, some only a sentence long. Business letters are not read the same way as articles, reports, or other literature for detailed information or analysis. Thus, paragraphs over ten lines in business correspondence which require much concentration may not be read carefully or read at all.

To enable the recipient to read the letters more rapidly and to comprehend and remember the important facts or ideas, should be used relatively short paragraphs of between three and eight lines long. In business letters, paragraphs that are made up of only a single sentence are common and perfectly acceptable [12; 16]. The general recommendation is to analyse the purpose, content, or function of each paragraph of a letters. Any paragraph that covers more than one thing should be rearranged and split it into two paragraphs. If you discover two short separate paragraphs that do the same thing, consider joining them into one.

Each different segment of the discussion – each different topic of the letter – should be placed in its own paragraph. Strategically important information should receive special emphasis in business letters. Information in the first and last lines of paragraphs is read and remembered better. Information given in the middle of long paragraphs is easily overlooked or forgotten altogether. Therefore, important information should be placed in rather noticeable positions. Less significant or positive information should appear in less visible points in the business letters. If some unfavorable or negative things are to be said, a good and acceptable strategy is place them in areas of less emphasis.

Formal business style is characterized by conciseness, laconism and economical use of

language means. Together with objective character and credibility of information they are the main requirements of this style. Official written documents cannot contain subjective opinion and emotional words. For formal business way of communication it is typical to use impersonal address, because the statement is usually made on behalf of an organization or officials. Regulation of relations and communication according to strictly defined standards resulted in the emergence of standardized formal speech and business style [5].

3. Language and Grammar Peculiarities

There are some other features of business language concerning language and grammar usage. Complex sentences, joined by conjunctions, rather than short sentences, are characteristic for formal business style. Simple but polite style is preferable without unnecessary wordiness, familiarity or slang.

Another important characteristic feature of business correspondence is the usage of passive forms when the doer of the action is insignificant. If it is not necessary to show the performer of the action, we can leave the reader unaware.

Your enquiry is being dealt with.

The order has been confirmed.

In the passive sentence, the grammatical subject receives the focus.

The decision was taken by the committee.

The visiting delegation was met by the vice president.

When we use the passive we can hide the subject or report unconfirmed, speculative information.

The shipment may be delayed.

The full conference programme has not yet been printed.

But, still usage of active forms is acceptable and conventional in business correspondence. Firstly, it is easier to read such type of sentence and secondly, these sentences take less words, thus reading takes less time.

One more thing to be remembered is that the verb must always agree with subject. No matter how many words separate the subject and the verb, make sure they agree. Moreover compound subjects always take a plural verb (e.g. *The contract and financial statement are authorized by our CEO*).

When an indefinite pronoun is used as the subject of a sentence, it is sometimes difficult to tell whether the pronoun is singular or plural. Some take a singular verb while others take a plural verb.

These indefinite pronouns take a singular verb:
anybody, anyone, each, either, everybody, everyone, neither, no one, one, somebody, someone.

These indefinite pronouns take a plural verb:
few, many, several.

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With the following indefinite pronouns one must judge from the context of the sentence whether to use a singular or plural verb:

all, any, most, none, some.

Cf. All of the employees are professional.

All of the money is invested.

Cf. None of the orders were processed.

None of the ledger was saved.

Other universal recommendations to follow while writing business letters: avoid using dangling, unclear modifiers, avoid split infinitives, avoid using clichés and jargon [1, 35-37]. On the whole, it is better to avoid using colloquial language or slang not to sound too familiar and impolite. It is important to get the right tone in the letter. This means that, generally speaking, the writer should aim for a neutral tone, avoiding the pompous language on the one hand and language which is too informal on the other.

Pompous, officious-sounding words should be avoided as well as slang and colloquial phrases. Therefore, watch out for puffed-up, important-sounding language [2; 15, 465-470] in business letters like:

aforesaid – named, mentioned above

arrived enclosed – enclosed with

as to whether – whether

due to the fact that – because

in regard to – concerning

thereafter – after that

Furthermore, choosing positive language will make our letter well-turned. Business writers and speakers recognize that positive, optimistic people are more open to new ideas and change, than are discouraged, unenthusiastic people. Therefore, such communicators have no opportunity to accentuate the positive. Find positive ways to express bad news in your business letters. Often, business letters must give bad news which should be conveyed in a tactful way. Doing so reduces the chances that business relations with the recipient of the bad news will end. If you have bad news for someone, you need not spill all of it in the first sentence. Thus, negative phrasing should be avoided in business letters. To convey bad news positively some words are better avoided (e.g. *cannot, forbid, fail, impossible, refuse, prohibit, restrict, deny*, etc.). For the above mentioned reasons, we should pay attention not only to the formality in the letter, but also on aspects which have some emotional influence on the reader

Abbreviations in Business Correspondence

In business correspondence a number of abbreviations are used, some of which are only suitable for informal communication, some even for electronic communication only (e.g. emoticons). In formal business letters, a clear, formal writing style should be used; however, there exist some instances in which the use of abbreviations is appropriate to save both space and time [13; 15].

Formal widely used abbreviations:

ASAP – as soon as possible

attn – attention: to show that a letter is for the attention of a particular person

cc – used on a business letter or e-mail to indicate that a copy of a given letter is being sent to the person mentioned

c/o or *c/-* – care of: used in the address on a letter or parcel that you are sending to someone at another person's house

encl. – enclosed or enclosure: used at the top or bottom of a letter to show that an attachment has been included in the letter

ETA – estimated time of arrival

FAO – for the attention of: written in front of someone's name on a document, letter, or envelope to show that it is intended for them

FYI – for your information: written on a business letter or e-mail to show that it is being sent to someone for their information only; they are not expected to reply or take any action

pp – on behalf of: written in front of someone's name when you are signing a letter for them

PTO – please turn over: used at the bottom of a page to indicate that there is a second page (informal)

RE – used in business letters to introduce their subject matter

ref. – reference: used in a business letter when you are giving the numbers and letters that show exactly which document or piece of information you are writing about

RSVP – used on written invitations to ask the invited person to confirm their attendance

TBA – to be announced

TBD – to be determined

Other often used abbreviations in business letters:

a/c – account

appar. – apparently

c. or ca. – approximately, about (Latin *circa*)

cf. – compare (Latin *confer*)

comm. – commerce

Corp. – Corporation

dt – date

e.g. – for example (Latin *exampli gratia*)

et al. – and other people (Latin *et alii*)

etc. – and so forth (Latin *et cetera*)

ibid. – in the same book, chapter, (Latin *ibidem*)

i.e. – in other words (Latin *id est*)

Ltd. – Limited

nb. – nota bene

NOO – not on original

p. a. – a year, each year (Latin *per annum*)

p. a. – per head (Latin *per capita*)

P&P – postage and packing

pdd – probable date of delivery

PIN – postal index number or Personal Identification Number



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SAE – stamped (self-) addressed envelope
vs – against (Latin versus)

ZIP (code) – Zone Improvement Plan
(used in US addresses after the state designation to assure delivery)

4. Components and Structure of Business Letters

Any standard business letter has certain common components and formulas which are recognized and handled accordingly. The number of components may vary significantly depending on the aim of the business letter [3; 7; 11; 15]. A basic business letter is composed in three steps: introduction, body of the letter and end remarks.

The introduction block states the reason for writing the letter. The introduction helps the reader understand in which context the letter should be considered. Possibilities include inquiries, demands, business offers, instructions for personnel, business requests, complaints, job inquires and more.

Introduction includes heading, inside address, salutation and subject or reference line.

The heading contains the writer's address and the date of the letter. If letterhead stationery is used the writer's name is not included and only a date is needed in a heading.

The inside address shows the name and address of the recipient of the letter. This information helps prevent confusion. Also, if the recipient has moved, the inside address helps to determine what to do with the letter. In the inside address, include the appropriate title of respect of the recipient; and copy the name of the company exactly as that company writes it.

Another significant issue is salutation in business letters. When you do have the names of individuals, remember to address them appropriately: *Mrs.*, *Ms.*, *Mr.*, *Dr.*, and so on. The salutation, the addressee's name, is followed by a colon. If you don't know whether the recipient is a man or woman, traditionally you write "*Dear Sir*" or "*Dear Sirs*". More recently, however, salutations such as "*Dear Sir or Madame*," "*Dear Ladies and Gentlemen*" or "*Dear Friends*" have been recommended. Notice that in the simplified letter format, the salutation line is eliminated altogether. Deleting the salutation line altogether or inserting "*To Whom It May Concern*" in its place, however, is not always a good solution, it's quite impersonal.

It is advisable to get a person's name within the organization, make a quick, anonymous phone call to get a name. Otherwise it is possible to address the salutation to a department name, committee name, or a position name: "*Dear Customer Relations Department*," "*Dear Recruitment Committee*," "*Dear Chairperson*," "*Dear Finance Director*".

The subject or reference line may replace the salutation or be included into it. The subject line

announces the main business of the letter. If you are responding to a letter, identify that letter by its subject and date in the first paragraph or sentence.

With reference to your advertisement in the Times,

With reference to your letter of 23rd March,

With reference to your phone call today,

Thank you for your letter of March 5th.

The body of the letter contains the actual message with details about what you would like to accomplish. This section of a business letter is extremely important. This is where you achieve your goals in writing a business letter [1, 35-37]. Therefore, state the main business, purpose or subject matter right away. Let the reader know from the very first sentence what your letter is about using the following phrases.

I am writing to inquire about ...

The reason I am writing is to confirm ...

I would like to comment on ...

I should apologize for ...

Remember that when business people open a letter, their first concern is to know what the letter is about, what its purpose is, and why they must spend their time reading it. Therefore, avoid round-about beginnings. In the first sentence of any main body paragraph of a business letter, try to locate a word or phrase that indicates the topic of that paragraph.

To make sure the main points are done clearly, fully and in a logical sequence it is advisable to priorities the arguments and facts, use conjunctions and link words for cohesion, itemize using lists whenever possible in a business letter. Listing spreads out the text of the letter, making it easier to pick up the important points rapidly. Lists can be handled in several ways using bullet points or other indicators. The link words are used to signal the kind of connection there is between one statement and another. To express contrast, result, emphasis, extra information, sequencing in time can be used the following phrases:

otherwise, apart from that, accordingly, whereas, hence, furthermore, moreover, besides; in

addition, thus, consequently, as a consequence, therefore, on the contrary, however, still, in spite of, despite, nevertheless, while, firstly, secondly,

next, lastly,

to begin with, I should inform you....

in the beginning..., at the outset.....

on the one hand..., on the other hand

to outline, to emphasize, to focus on, to highlight.

The Conclusion contains information about intended next steps and actions – what you would like to happen in the future. The writer should provide a call for future action. This can be a chance to talk in person, a follow-up letter or more. It's important to make it clear that you would expect the next step from the person reading your business letter.

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Give your business letter an ‘action ending’ whenever appropriate. An ‘action-ending’ makes clear what the writer of the letter expects the recipient to do and when. Ineffective conclusions to business letters often end with rather limp, noncommittal statements such as ‘Hope to hear from you soon’. Instead, or in addition, specify the action the recipient should take and the schedule for that action.

At the end of a body section come closing remarks and reference to future contact:

Thank you for your help.

Please contact us again if you have any questions

Please contact us if there are any problems.

Let me know if I can be of any further assistance.

I look forward to hearing from you soon.

I look forward to meeting you next Tuesday.

After the body paragraphs come end remarks including complimentary close, signature block, end notations (enclosures or copies).

The complimentary close is the phrase used after the body of the letter. There are three types of complimentary close: formal, standard and informal. The following phrases can be used with any type of complimentary close:

Sincerely, Sincerely yours, Yours sincerely,

In addition, for formal complimentary close are used:

Respectfully, Respectfully yours,

For informal complimentary close are appropriate:

Yours truly, Cordially,

Notice that only the first letter is capitalized, and it is always followed by a comma.

Signature block. Usually, the writer’s name is typed four lines below the complimentary close, and signed in between. If the writer is a woman and wants to make her marital status clear, *Miss, Ms.,* or *Mrs.* are used in parentheses before the typed version of the first name. Whenever possible, the title or the name of the position held should be included just below the name.

Just below the signature block are often several abbreviations or phrases that have important functions and are called end notations (enclosures or copies).

Enclosures. To make sure that the recipient knows that items accompany the letter are in the same envelope, such indications as *Enclosure, Encl., Enclosures (2)* are used.

Copies. If copies of a letter are sent to others, this fact is indicated among the end notations also. If, for example, a copy is sent to a lawyer, write something like this: *cc: Mr. Raymond Mason, Attorney.* It should be noted that ‘cc:’ is not capitalized and is always followed by a colon.

5. Formats for Letter Writing

The format of a piece of writing is the way it is organised and arranged. The format used for a letter is typically determined by the person writing the letter. Sometimes a company will have a house style for a format in which letters must be written, but typically the writer must choose the format [6; 11].

The standard formats used for most business letters written today are: the block, semi-block, and indented letter formats [15, 31]. These three formats can all be used effectively for writing any business letter.

Block

The block format is sometimes called ‘complete block’ or ‘full block’. In this format, all the lines of the letter, from the dateline to the last notation, are flush with the left margin. Paragraphs are not indented but rather begin flush with the left margin. Single-spacing is used within the paragraphs, and double-spacing between the structure parts of the letter.

The salutation should be typed two lines below the inside address or attention line if there is one. If there is a subject line, it is typed two lines above or below the salutation. The body of the letter begins two lines below the salutation or subject line if there is one. Two lines below the last line of the letter, the complimentary close is typed. The signature block is typed four lines below the complimentary close. An identification line is typed two lines below the signature block. All other notations (e.g., enclosure, distribution) are typed two lines below the identification line.

Semi-block

The semi-block format, sometimes called ‘modified block’. This format differs from the block in the position of the dateline (and reference line if there is one) and the complimentary close and signature block. The dateline is usually aligned with the right margin, although sometimes it is centered in relation to the printed letterhead if this presents a more balanced look. The complimentary close and signature block can correctly be placed in any of several locations. Paragraphs are not indented. The spacing of various parts of the semi-block format letter is the same as for the full block format.

The semi-block format is widely used because of the balanced look it gives to a letter. Since everything is flush with the left margin in the full block format, it almost appears as if the letter might tip over to the left. In the semi-block format, since the date, complimentary close, and signature block are toward the right, the letter is balanced in place and not tipped to either side.

Indented format

The person writing the letter may choose also indented format. In that case all the paragraphs are indented. In the indented format letter, as in the previous formats, various parts begin at the left

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margin, except for the date and the complimentary close and the signature.

6. Conclusion

Business correspondence is indispensable part of business communication. To write an effective and successful business letters, arguing and achieving the business objective, it is essential to comprehend the whole range of such things as: occasions on which the particular letter is written, the style of letter, useful and accepted expressions.

The major features of business language are: conciseness, laconism, specific terminology, objective character. Each type of business letter has its own standard phrases and clichés. By using these standard phrases, it is possible to give a professional tone to business letters, effectively reveal the content of the message and achieve business aims. The

paragraphs of business letters tend to be short, some only a sentence long.

There are some other features of business correspondence concerning language and grammar: wide usage of passive forms, complex sentences, rather than short sentences. Simple but professional language is preferable without unnecessary wordiness, familiarity or slang.

The number of standard business letter components may vary significantly depending on the aim and situation of business communication and usually includes heading, inside address, salutation and subject or reference line, the body or main part of any business letter, complimentary close, signature block, end notations.

The business letters can be arranged in the block, semi-block, and indented letter formats used for most business correspondence.

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SECTION 12. Geology. Anthropology. Archeology.

MATHEMATICAL MODEL OF OPTIMIZATION OF PROCESS OF
CRUSHING OF GLASS IN THE JET MILL

Abstract: *Mathematical modeling of processes of crushing of aluminosilicates, namely I flew down, it is intended for studying of the principles of creation of computer models of optimization of process of crushing. These results will help to answer the specific questions containing in technology of receiving composite materials on the basis of mica and glass.*

Key words: *micag, lass, mathematical model, optimization.*

Language: *Russian*

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МАТЕМАТИЧЕСКАЯ МОДЕЛЬ ОПТИМИЗАЦИИ ПРОЦЕССА ИЗМЕЛЬЧЕНИЯ СТЕКЛА В
СТРУЙНОЙ МЕЛЬНИЦЕ

Аннотация: *Математическое моделирование процессов измельчения алюмосиликатов, а именно стекла, предназначено для изучения принципов построения компьютерных моделей оптимизации процесса измельчения. Эти результаты помогут ответить на конкретные вопросы, содержащиеся в технологии получения композиционных материалов на основе слюды и стекла.*

Ключевые слова: *Слюда, стекла, математическая модель, оптимизация.*

Теоретически точное описание процесса измельчения стекла требует учета широкого спектра факторов. Прежде всего, это затраты энергии на предельные упругие и пластические необратимые деформации, которые определяют характер модели.

Наряду с этими, имеются и другие затраты энергии: на трение, на образование агрегатов и т.д. В силу малой изученности последних, не теряя качественной адекватности модели, можно ограничиться рассмотрением предельных упругих деформаций.

С известной степенью приближения можно считать, что

$$Dw = K - \varepsilon \varepsilon (1 - S/S_m), \quad (1)$$

где W - плотность энергии, передаваемой частице. S удельная поверхность частицы, S_m удельная поверхность предельно измельченного порошка, ε - энергия, затраченная измельчителем, K - КПД измельчителя. В процессе измельчения удельная поверхность частиц S приближается к значению

удельной поверхности S_m измельченного порошка, с некоторым заданным размером частиц.

Интегрированием уравнения (1), подробно см. Г.С. Ходаков "Тонкое измельчение строительных материалов", и дельнейшими преобразованиями получаем уравнение степени измельчения

$$S = S_m(1 - e^{-k_2 t}), \quad (2)$$

где $k_2 = k_1 \cdot N/V$, N - мощность измельчителя, V - объем измельчаемого порошка, K - КПД ударного разрушения частицы, равный отношению энергии разрушения к общей величине кинетической энергии частицы перед ударом. Важнейшим содержанием этой модели является экспоненциальный характер асимптотического приближения к кондиционному значению S_m . Определенную специфику придает то, что V не является постоянным в течении процесса. Из (2) следует, что уменьшение V приводит к более быстрой сходимости S к S_m .

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Качественная модель определяет подход к построению регрессии на основе

экспериментальных данных, представленных ниже для фракции $0.1 < S_m < 0.2$.

Таблица 1

T, ч	0,5	1	1,5
Выход, у	0,412	0,609	0,89005

Уравнение регрессии процесса измельчения стекла в струйной мельнице имеет вид:

$$y = 1 - at^2 * e^{-bt} \quad (3)$$

Здесь у - оценка выходного параметра модели (процент выхода необходимой фракции.); экспоненциальная составляющая отражает качественное поведение модели, а квадратический член ее специфику; t - входной параметр (время). Применяя логарифмирование для (3), получим

$$\ln(1-y) = \ln a + 2 \ln t - b t$$

Пусть $1 - y = x$, $x = (x_1, x_2, x_3) = (0,588, 0,391, 0, 10995)$, $t = (t_1, t_2, t_3) = (0,5, 1, 1,5)$.

Для регрессии воспользуемся методом наименьших квадратов, находя постоянные а, b, из следующей системы нормальных уравнений:

$$\begin{cases} \sum \ln x_i = n \ln a + 2 \sum \ln t_i + b(\sum t_i), \\ \sum (t_i \ln x_i) = (\sum t_i) \ln a + 2 \sum (t_i \ln t_i) + b(\sum t_i^2), \\ \sum (\ln t_i * \ln x_i) = (\sum \ln t_i) * \ln a + 2 \sum \ln t_i^2 + b(\sum t_i \ln t_i), \end{cases}$$

где n = 3, количество испытаний. Подставляя известные значения у и t из таблицы, решаем систему. В результате, a = 16.3173, b = 3,8739.

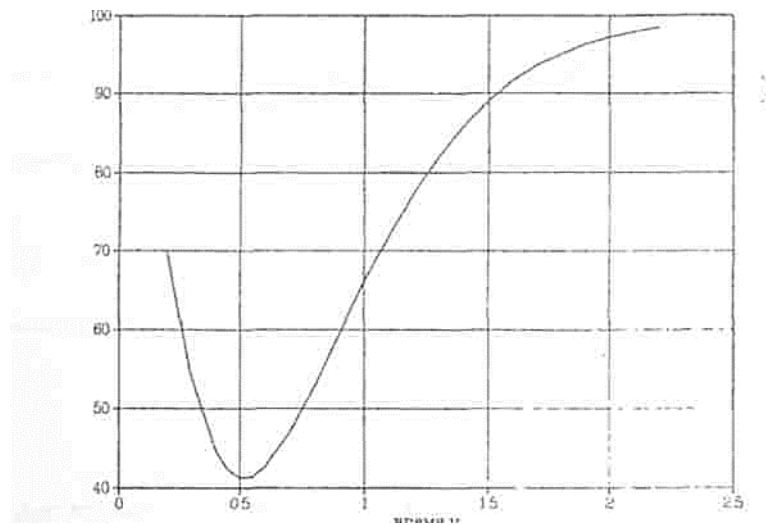


Рисунок 1 - Общий вид кривой, полученной в результате регрессионного анализа по опытным данным.

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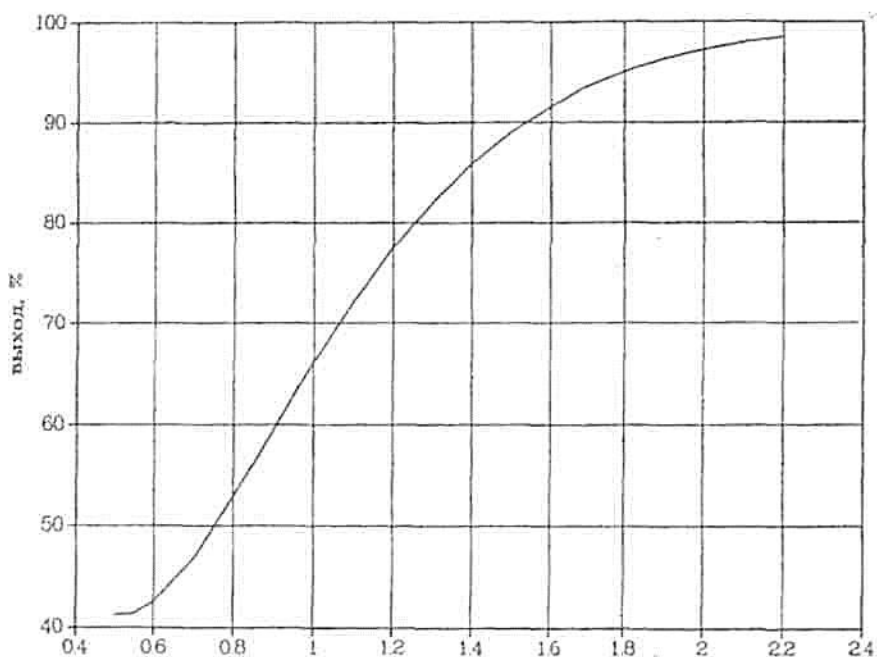


Рисунок 2 - Зависимость выхода необходимой фракции от времени протекания процесса измельчения стекла на струйной мельнице.

Таблица 2

T, ч	0,3	0,5	0,7	0,9	1	1,1	1,3	1,5	1,7	1,9	2
Y, %	82,08	41,2	46,89	59,54	66,09	72,15	82,08	89,005	93,49	96,25	97,18

Вид полученной зависимости представлен на рисунке 2. Неадекватные модели поведения кривой при $t < 0,5$ ч объясняются тем, что затраты энергии на пластические деформации становятся преобладающими, когда основная масса частиц достигает достаточно малого размера. До этого момента все приведенные выше рассуждения не имеют места

$$y=1-16,3173 t^{2* e-3,8739}$$

Итак, перед нами регрессионная модель (6) зависимости выхода стекла крупностью - 0,2 + 0,1 протекания процесса измельчения на струйной мельнице удовлетворяющая всем необходимым условиям, при $0,5 < t < \infty$ функция монотонно возрастает и при $t \rightarrow \infty y \rightarrow 1$. При проведении расчетов с базами данных Quattro Pro. С помощью разработанной математической модели по оптимизации измельчения стекла в струйной мельнице решена задача, связанная с максимальным выходом стекла необходимого класса крупности при минимальных энергетических затратах до времени.

Итак, перед нами регрессионная модель (6) зависимости выхода стекла крупностью - 0,2 + 0,1 протекания процесса измельчения на

струйной мельнице удовлетворяющая всем необходимым условиям, при $0,5 < t < \infty$ функция монотонно возрастает и при $t \rightarrow \infty y \rightarrow 1$. При проведении расчетов с базами данных Quattro Pro. С помощью разработанной математической модели по оптимизации измельчения стекла в струйной мельнице решена задача, связанная с максимальным выходом стекла необходимого класса крупности при минимальных энергетических затратах до времени. В результате выполненных исследований разработано стекло нового химического состава: SiO₂- 36,5 %, Al₂O₃- 0,25 %, F₂O₃ - 0,005 %, CaO - 3, %, MgO - 0,99 %, Na₂O- 10,9 %, B₂O₃ - 14,55 %, K₂O - 20,6 %, BaO - 12,82 %, S₂O₃ - 0,25 %, которое за счет нейтрализации оксида кремния, обладает пониженной температурой размягчения. Разработана математическая модель по оптимизации процесса измельчения стекла в струйной мельнице, которая объясняет, что затраты энергии на пластические деформации становятся преобладающими, когда основная масса частиц достигает достаточно малого размера. Найден максимальный выход класса крупности -0,2 +0,1, равный 89,9 %, за

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минимальное время измельчения, которое составляет 1,5 часа работы мельницы. При этом удельная поверхность частиц приближается к

удельной поверхности предельно измельченного стеклянного порошка.

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