Therefore, innovative technologies open new perspectives in rehabilitation medicine, providing innovative, effective methods to support and accelerate the recovery of patients' functions, also these technological shifts open new horizons for optimizing recovery and enriching the practice of physical therapy [2].

REFERENCES

1. Віртуальна і доповнена реальність у медицині: як ці технології допомагають пацієнтам. cases.media. URL: https://cases.media/en/article/virtualna-i-dopovnena-realnist-u-medicini-yak-ci-tekhnologiyi-dopomagayut-paciyentam (дата звернення: 13.03.2024).
2. Інноваційні технології у фізіотерапії. physicrecovery.com. URL: https://www.physicrecovery.com/physrecrynews (дата звернення: 17.03.2024).
3. Новітні технології в реабілітації. physio-pedia.com. URL: https://langs.physio-pedia.com/uk/emerging-technologies-in-rehabilitation-for-complex-injuries-and-conditions-uk/(дата звернення: 07.03.2024).
4. Реабілітація та віртуальна реальність: як нові технології допомагають відновлюватись пораненим. rubryka.com. URL: https://rubryka.com/article/vr-terapiya-dlya-reabilitatsiyi (дата звернення: 07.03.2024).
5. Роботизована реабілітаційна терапія. acibadem.ua. URL: https://acibadem.ua/treatment/robotic-rehabilitation-therapy (дата звернення: 14.03.2024).

M. Netesa, O. Syzenko, O. Novikova

MODERN RESEARCH IN THE FIELD OF GEOGRAPHY

Topicality. Modern geography is characterized by high rates of technological development and extremely high integration of various fields of activity, geography remains an important and relevant science, as it helps not only to understand and analyze complex geographical changes occurring in the world, but also to predict the possible consequences of such changes. Currently, geography uses modern research methods that allow studying interactions between different regions and countries in the context of globalization, helps to better understand the geographical aspects of economic, social and cultural changes taking place in the world, to improve the efficiency of management of available resources

The purpose of the research is the analysis of modern research methods in the field of geography and their practical application.

Analysis of sources: For the analysis of the source base, we used authoritative sources of information that have no doubts about their reliability. From the standpoint

of the ideological direction of research, such resources as: Modern geographical studies [1], Theory and methodology of geographical sciences [2] (data analysis), Geography: a promising modern science or a relic of the past? [3], Consequences of the Great Geographical Discoveries [4], International research of the globe [5], Modern geographical studies [6], Actual problems of today of geographical science and education [7], Socio-geographical research: methodology, methods, methods [8], Methodology of geography [9], Geoinformation systems and technologies and their use in tourism [10].

Geography is an important science because it allows you to study climate change, the location and vulnerability of different regions to natural disasters (the impact of these phenomena on people, ecosystems and infrastructure), studies the development and transformation of cities and regions (propaganda of sustainable development, as well as the preservation of biodiversity).

All these aspects confirm that geography remains a key discipline for understanding the modern world and solving complex global problems.

Indeed, nowadays geography has turned from a descriptive science into an explanatory one. After all, there is practically no unexplored centimeter left on the planet that has not been mapped [3].

Let's summarize the results of the analysis of the source base in a comparative Table 1, which visually compares information about the main discoveries of scientists.

Looking at the table, we can see that researchers have made a great contribution to the development of geography, because by opening new horizons, we expand our knowledge and perspectives, which give us the opportunity to explore different corners of our planet.

The International Polar Years (IPR), when international studies of the Earth's polar regions were conducted, were important for the study of the earth. There were four such years: 1882-83 (First), 1932-33 (Second), 1957-58 (Third), 2007-2009 (Fourth). During the time of the First, 36 volumes of scientific works were published, research was conducted mostly in the geophysical, meteorological, and biological spheres. The second was held at 58 stations. Even radiosonde, radiophysical and acoustic studies of the atmosphere were conducted. The third took place within the framework of the International Geophysical Year. 67 countries took part in it.

Table 1. The main discoveries of scientists
(compiled by the author on the basis of [1,2 (p.43-54)]

Researcher	Years	Discovery
Pythagoras	VI ст.	Made the first assumptions about the sphericity of the Earth
Eratosthenes		Made the world's first map of the world using a geographic grid
Claudius Ptolemy		He created the famous work "Guide to Geography", compiled 26 maps of individual parts of the earth's surface and one composite map of the world with a degree grid
Herodotus		He introduced the concept of "historical geography", described the life and lifestyle of the Scythians for the first time
Eric Rudy	X ст.	Discovered the island of Iceland and Greenland
Vasco da Gama	1497-1499	Opened a sea route to India
Fernand Magellan	1519-1522	Made the first round-the-world trip, confirmed the sphericity of the Earth and proved the existence of a single world ocean
Willem Janszon	1606	Discovered Australia
Thaddeus Bellinshausen, Mykhailo Lazarev	1820	Discovered Antarctica
Mykola Mykolayovych Mykluho-Maklai		Proved that people, regardless of race, are related by origin
Frederick Cook	1908	Reached the North Pole
Roald Amundsen	1911	Reached the South Pole
Otto Schmidt		Made the first through sailing from the White Sea to the Bering Sea
Jacques-Yves Cousteau		He studied the oceanic depths. Invented a space suit with scuba diving
Jacques Picard, Donald Walsh	1957	They discovered the deepest ocean depression – the Mariana Trench (11,022 m)
Yuri Gagarin	1961	Made the first flight into space
Leonid Kadenyuk	1997	Made a flight into space as part of the international crew of the American spaceship "Columbia"

Compiled by the author on the basis of [1,2 (p.43-54)].

Then there was the establishment of bases in Antarctica and a number of expeditions into the depths of the continent, the establishment of floating observatories on ice sheets in the Arctic. During the Fourth, more than 800 projects were carried out, which were aimed at determining the current state of the environment in the polar regions. The main areas of activity in the polar zone were defined as:

- creation of a single climate monitoring network in Antarctica.
- global snow, ice and permafrost monitoring system (Global Cryosphere Watch).
- work on forecasting the state of seas and glaciers [5].

One of the important results of the development of geography can be considered the creation of a new science – ecology, which studies the impact of man on the environment – and vice versa. It is necessary to develop accurate means of predicting natural disasters for the timely evacuation of the population. Research of the World Ocean and space also has an important role for the further search for resources important for the development of mankind. The creation of nature reserves and even the development of tourism are tasks facing geographers [3].

Geographers use the general scientific balance method. In all cases, when we know the amount of one or another resource component and the directions of its use, it is advisable to analyze its balance by comparing "income-expenditure". In social geography, balances of natural resources, population and labor resources, fuel, electricity, food, freight flows, production and consumption, income and expenses are considered. More special is the method of inter-industry balances, according to which the movement of certain resources between industries and between regions is analyzed [8, p. 88].

It is geography that studies the world around us as functionally whole, tries to combine the study of objects with different genesis. And precisely because of this synthetic essence, geography does not fit into the generally accepted variants of the classification of sciences. It is not for nothing that due to this specificity, in most pedagogical universities, the relevant faculties are called natural and geographical faculties [7, p. 3].

Thus, the Great Geographical Discoveries summed up the previous historical period and created opportunities for the further development of European civilization [4]. Because geographical research requires a wide range of methodological approaches that mutually complement each other [9, p. 15].

But not all the secrets of the Earth have been solved yet. And modern technologies and innovative equipment give geographers access to research that their colleagues could only dream of decades ago. This is the study of the glaciers of Antarctica, and the highest mountain peaks, and the deepest ocean depressions, and even space [3]. Among the modern means of research in geography, one can also note the use of space technology (satellite images, global positioning systems, climate analysis, etc.), the creation and wide implementation of geoinformation systems. And from the most modern, you can evaluate the use of artificial intelligence.

Space probes exploring the Earth are equipped with special photography devices, with the help of which space pictures are obtained. Analyzing them, people

can immediately look around the vast expanses of the Earth. The biggest features of the structure of our planet became visible from a height. From the surface, they are simply impossible to distinguish. From space, it was possible to look into hard-to-reach corners of the Earth: highlands, polar regions, vast oceans, forests and deserts. Space vehicles are used to observe natural phenomena: volcanic eruptions, river floods, snow avalanches, storms. Pictures quickly and, most importantly, safely convey information about the disaster area. Meteorological satellites "survey" the Earth and determine the nature of cloud cover and the distribution of snow cover. Space images help predict the weather, find mineral deposits, and determine the extent of pollution on the Earth's surface. There is no doubt that we are standing on the threshold of a new era of great discoveries: outer space and, with it, our planet [6].

Among the main sources of data for geoinformation systems are remote sensing materials. They combine all types of data received from space carriers (manned orbital stations, satellite cameras systems) and aviation based (planes, helicopters) and make up a significant part of remote data contact types of shooting, methods of obtaining measuring data systems in conditions of physical contact with the shooting objects. To contactless in addition to aerospace, shooting methods include various measuring systems marine and land-based, including phototheodolite surveying, seismic, electrical, magnetic surveying, hydroacoustic surveys of the topography of the seabed with the help of side view sonar, based on registration of own or reflected wave nature signal [10].

Contemporary research in geography reflects a dynamic and interdisciplinary approach to understanding the complex relationships between people and the environment. Modern methods and means of research in geography cover a wide range of topics, include advanced technologies, geo-information systems and provide qualitatively new opportunities to ensure sustainable development.

REFERENCES

1. Modern geographical studies [Electronic resource]. Resource access mode: https://disted.edu.vn.ua/courses/learn/1926
2. Theory and methodology of geographical sciences [Electronic resource]. Resource access mode: https://geography.lnu.edu.ua/wp content/uploads/2020/06/Teoriia_metodolohiia_heohrafichnoi_nauky_posibnyk_praktykum.pdf
3. Geography: a promising modern science or a relic of the past? [Electronic resource]. Resource access mode: https://b-pro.com.ua/statti/geografiya-perspektivna-suchasna-nauka-chi-perezhitok-minulogo

4. Consequences of the Great Geographical Discoveries [Electronic resource]. Resource access mode: https://disted.edu.vn.ua/courses/learn/804
5. International research of the globe [Electronic resource]. Resource access mode:https://geography.edera.com/geografichne_piznannya_zemli/internationl
6. Modern geographical studies [Electronic resource]. Resource access mode: https://geomap.com.ua/uk-g6/741.html
7. Actual problems of today of geographical science and education [Electronic resource]. Resource access mode: https://library.sspu.edu.ua/wpcontent/uploads/2018/04/kruglii_stil_geo_2016.pdf
8. Socio-geographical research: methodology, methods, methods [Electronic resource]. Resource access mode: https://kyivobl-man.in.ua/wp-content/uploads/2021/11/Suspilno-geografichni-doslidzhennya-metodologiya-metody-metodyky_compressed.pdf
9. Methodology of geography [Electronic resource]. Resource access mode: https://dspace.udpu.edu.ua/bitstream/123456789/11701/1/posibnuc.pdf
10. Geoinformation systems and technologies and their use in tourism [Electronic resource]. Resource access mode: https://learn.ztu.edu.ua/pluginfile.php/265129/mod_resource/content/1/L9_GIS.pdf

O. Perik, Yu. Matsuk, O. Posudiievska

IMPROVING THE TECHNOLOGY OF MEAT SLICED SEMI-FINISHED PRODUCTS ENRICHED WITH MICRONUTRIENTS AND MINERALS

In recent years, the global market for new technologies and food products has seen a trend towards an increase in the number of qualitatively new products designed to prevent and treat various diseases, strengthen body defenses and reduce the risk of exposure to toxic compounds and unfavourable environmental conditions. Under market conditions, the dynamic development of the food industry is carried out mainly by the introduction of new intensive low- and zero-waste technologies and the production of health and preventive food products based on them. Of particular concern is the lack of essential micro- and macronutrients in the diet, which causes such serious diseases as iron deficiency anemia, rickets, osteoporosis etc. [3, 4].

The problem of calcium deficiency in the daily human diet has become quite relevant. This is primarily due to the excessive phosphorus content in most food products – meat ones in particular, as well as because of the wide use of phosphates in the processing of food raw materials [1, 2].

Calcium supply is determined not so much by its absolute amount in the body as by its ratio to other nutrients: proteins, fats, carbohydrates, minerals, and, above all, phosphorus.