HISTORICAL TRANSFORMATIONS OF CARGO TRANSPORTATION'S TRADITIONAL TYPES AS AN INTEGRAL INFRASTRUCTURE OF THE ECONOMY OF UKRAINIAN LANDS

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Annotation. *The article analyzes the processes of origin and development of cargo transportation primitive types in Ukraine. The article considers the grounds that the halo of Trypillia culture is the territory of the invention of the wheel – the oldest mechanical device. The transformational factors of types and means of transportation processes in different historical times and the essential importance of transport routes for economic development are determined.*

Key words: *wheel, animal transport, water transport, waterways system, transport network, water infrastructure, Trans-European Transport Network (TEN-T), European integration.*

Introduction and problem statement. At present, the efficiency of transport, transport network and level of logistics determine and will be the basis of economic development of Ukraine in the next 10 years. The National Transport Strategy of Ukraine envisages, first of all, the realization of domestic interests in the field of transport and logistics. At the same time, this document stipulates the connection of the Ukrainian modernized transport network to the single multimodal Trans–European Transport Network (TEN-T).

In this regard, the gradual implementation of EU directives and regulations in accordance with the Association Agreement will ensure infrastructural European integration. Ukraine's transport infrastructure will become one with the EU infrastructure and will develop in a harmonious combination. In the framework of European integration processes in December 2020, the Verkhovna Rada of Ukraine adopted the Law "On Inland Water Transport".

According to the trends of world trade, a significant increase in trade turnover in the direction "Europe – Asia-Pacific region countries" is expected in the nearest future. Trade in the direction of the European North–South axis is also expected to grow. A sustainable increase in cargo transportation is also expected for water transport. Ukraine, based on the centuries–old history of transport traditions, currently has additional potential for the resumption of domestic cargo transportation, attracting transit flows, especially by

the traditional water direction, provided the development and modernization of water transport infrastructure.

Given the renewed attention and importance of water transport potential in Ukraine, as well as the need to determine the status of Ukrainian lands in relation to the original modes of transport inherent in these territories, it is necessary to refer to the historical origins of the first transport networks of European importance.

Analysis of recent research and publications. Scientific research of the processes and terms of the first vehicles' production, the development of the original types of cargo transportation by animal and water transport, the creation of the first sustainable road systems was started in the early XX century and continues today. Scholars in various fields of study: linguistics, archeology, law and economics consider aspects related to the initial formation and development of the transport industry. Thus, the generalizing work of M. Golushko is devoted to the connection ways and vehicles of Ukrainians, the genesis of the animal team and traditional means of transportation by water [2]. B. Tomenchuk and B. Yavir Iskra analyze in their works the location of European tribes in ancient times and the routes of the first transport networks on the basis of information from the ancient chronicle "Bavarian Geographer" [14, 17]. The issues of the Central Europe tribes development in ancient times, as well as the development of the communication lines are revealed in the A.D. Udaltsova's scientific generalizations [15]. T. Ignatieva studied the economic significance of Ukrainian trade routes in the XVIII – XIX centuries [4]. Yu. Sokurov has devoted his work to the legal aspects of trade activity in the transport network at a given time by examining the phenomenon Chumatstvo [13].

In addition, the proposed article is written on the basis of studying the chronicles of Ukrainian lands in the XVIII century [6, 7] and a wide base of various materials discussing historical and contemporary transport issues reflected on the Internet. Despite a sufficiently deep and comprehensive consideration of the transport network's development in Ukrainian lands in different periods of history, it was worth to consider the process of historical transformation and clarify the significance and inseparability of the transport network of Ukrainian lands from Trans-European one from the view point of modern integration events.

The purpose of the article is to consider the processes of origin and development of cargo transportation primitive types in Ukraine, to determine the transformational factors of types and means of transportation, as well as to substantiate the decisive role of the transport network for economic development of state formations that have existed for centuries on Ukrainian lands.

The main results of the study. Cargo transportation, as one of the most important types of human labor, has deep historical roots. The world history of cargo transportation is inextricably linked with the development of the world economy and trade relations between different states and peoples. At all times of the world civilization development, the transportation of goods was of exceptional economic importance for the development and maintenance of trade, regional production, and international cooperation.

Cargo transportation has always had a general civilizational aspect. Therefore, based

on technical and technological discoveries, over the centuries there has been a process of continuous improvement of cargo delivery methods, creation of the new transport modes and the introduction of new transportation technologies. However, despite the constant process of improvement and development, cargo transportation is characterized by the invariability of the goal – to ensure fast and reliable delivery at the lowest cost of any resources during transportation.

Cargo transportation has become possible thanks to the greatest achievement in the mechanics in the centuries-old history of mankind – the invention of the wheel. The invention of the wheel about 6 thousand years ago was a significant step in the technical progress of mankind. Today, the wheel is used in almost all types of vehicles: any carts, cars, trains, as well as a chassis in airplanes, helicopters and more.

For a long time, there was a widespread version that the wheel was first invented by the Sumerians in Mezhyrich at the end of 4th millennia BC, whence it spread to Eurasia and North Africa. But archaeological finds, technological research of artifacts, linguistic research of the late XX century indicated that the wheel mechanism was most likely invented in Central Europe, and from there came to the Middle East.

The first images of the wheel mechanism and carts were found in modern Poland, Romania, Ukraine and the Eurasian steppes. According to the Finnish scientist Asko Parpola (b. 1941), an Indologist from the University of Helsinki, there are linguistic reasons to believe that the wheel was invented in the Trypillia culture in modern Ukraine [16]. A version of the European origin of the wheel was put forward in the 1990s by the modern German scientist A. Heusler. About the findings of wheel models in the excavations of Trypillia settlements of the last quarter of 5th millennia BC (millennia before the relevant finds in Mesopotamia) was reported in 1981 in scientific publications by the Romanian archaeologist Dean. From here, the innovation spread rapidly throughout Europe: evidence of the existence of the wheel is found in the settlements of Zuschen (Germany), Bronozice (Poland). The remains of carts was found in the late 1980s in the Krasnodar Territory of Russia dated back to the middle of 4th millennia BC [11].

The next mention of the wheel was found in Mesopotamia in the late 4th millennium BC [5]. That is, according to archaeological research, the first ancient wheels belonged to the period 5000–3500 BC and were found in places where there was a fairly high level of civilization, where people were familiar with the various industries, mastered the smelting of metal and so on. The process of moving large cargoes has become a practical necessity in this state of civilizational development. Central European territories were one of the centers of advanced civilization at that time.

After the invention of the wheel, animal transport played an important role in cargo transportation. The network of the first trade routes was rapidly created, which included separate routes and stops used for commercial transportation of goods. One long–distance trade route consisted of trunk arteries connected by a network of smaller commercial and non–commercial transport routes.

Trade caravans transported goods through the entire territory of the Ecumenical (part of the world mastered by mankind, introduced by the ancient Greek geographer

Hecate of Miletus (550 – 490 BC)), through Europe and all known states. Powerful ancient states, like Egypt, Persia and Rome carried out many nationwide measures to develop road systems for the delivery, primarily of state correspondence, mail, rapid advance of troops, as well as for the development of domestic and international trade.

Everyone knows the concept of "Great Silk Road" – the general name of the caravan trade routes, formed in the II century BC (up to 12 thousand km) and lasted until the VII century. These paths were fairly stable "corridors" through which there was an intensive exchange of goods, ideas and people between the civilizations of East and West [3, p. 26]. This system of roads began in the central regions of China, then the road diverged to the southern and northern directions, which stretched through the territories of modern countries, such as: Afghanistan, Turkmenistan, Uzbekistan, Iran, Iraq to the Mediterranean ports of Tire (now Sur, Lebanon) and Antioch (now Antakya, Turkey). Even then, goods from Mediterranean ports arrived in Europe, including via the Black Sea.

However, in Europe itself, even in the Copper and Bronze Ages (3rd – 2nd millennia BC), there was a fairly stable network of trade routes that ensured the emergence and development of interregional trade. The main trans–European routes of the time were "salt", "amber", "copper", "tin", "silk" and so on. Already at the beginning of the 1st millennium AD, according to the famous Roman historian and geographer Tacitus (c. 56 – c. 117) and the ancient Greek scholar Ptolemy (c. 87 – 165), constant communications between individual tribes and nationalities were active in Central Europe: roads from the Baltics to the upper reaches of the Dniester and further south; the road along the Dnieper, which connected the Upper Dnieper tribes with the Middle Dnieper ones, and further south to the sea; the route from Dacia across the Black Sea coast to the Middle Volga and the Kama, and another route through the steppes of the northern Black Sea coast to the east, to Central Asia, along which a broad military alliance of "Alanian" tribes was formed; from the North Sea across the Rhine to the Danube and further south to Rome or Byzantium. The largest settlements of local tribes ("cities" in the words of Ptolemy) were along these roads. Together with the ancient cities, they promoted trade and cultural relations in the vast expanses of central Europe, which has traditionally been called European Sarmatia. Most of the trans–European roads were also Transcarpathian and merged into one Transcarpathian system, as the Carpathian region had some of the largest deposits of copper, silver and salt in Europe, and from the Odra went to the Carpathians tin needed for bronze [14, 15].

In the Middle Ages, some of the ancient ways declined, some had further development, new ways appeared. New cities were created on the roads, which became regional or even state capitals. Ways and trade determined policy no less than policy determined economic development. From ancient times, the Middle Ages inherited the trans-European continental "amber" and "tin" routes and their branches, as well as the sea routes by the Baltic, Mediterranean and Black Seas.

German researcher J. Herrmann identified several such paths in the Central European region between the Frankish Empire and the Khazars:

– Magdeburg – Rebus – Poznan – Kyiv;

– the mouth of the Danube – Dniester – Vistula – Baltic;
– Sarkel – Kyiv – Byzantium;
– Krakow – Bautzen – Erfurt – Prague – Krakow [17].

Thus, it should be noted that since ancient times, the territory of modern Ukraine has been naturally included in the European transport system using animal and water transport.

Land transport directly depended on various ways of using draft animals, which in Ukraine had always been oxen. In the Eneolithic – Bronze Age (5tht – 4h millennia BC) they were harnessed only in pairs. A pair of draft animals dominated in subsequent historical periods. In particular, two or three pairs of oxen harnessed Scythians in carts, a pair of oxen dragged the wheeled vehicles of the Sarmatians. Even Ukrainian Chumaks often harnessed two pairs of oxen to carts in the XV – XIX centuries [2, p. 37].

Chumatstvo was the most common business activity in Ukraine, the essence of which was to transport various goods by artel method (using oxen or drawn vehicle), and to provide wholesale or retail trade of these goods for profit.

Chumatstvo originated from the caravan trade of the Kievan Rus times and exhausted itself with the introduction of railways in the XIX century. As an important component of economic life at all historical stages, Chumatstvo had a great commercial weight. It was a symbiosis of trade and transport, an integral infrastructure of the economy, a unique national Ukrainian phenomenon [13].

From the beginning of the XVI century, Ukrainians began to use one horse's harness for everyday life and transportation of goods over short distances.

The need for fast and systematic delivery of mail led to the emergence of stagecoach in the British Isles in the middle of the XVI century. It was a four-wheeled vehicle on a rigid suspension, which was pulled by four horses. Stagecoaches were used on regular lines and carried mail and passengers. The invention of stagecoaches, the definition and official consolidation of major transport routes, led to the emergence of a network of post offices. At such stations, tired horses were changed, which allowed them to ride almost without long stops. Royal postal stagecoaches accelerated the improvement of the road system in the British Isles by creating toll roads. Inns (prototypes of hotels) were opened all over Europe to serve stagecoach passengers.

A similar network of yam (post) stations was established in the Ukrainian territories that were part of the Moscow state. In 1669, the Hetman of the Left Bank of Ukraine Demyan Mnogohrishny signed an agreement with the Moscow government – "Glukhov contract articles", Article 10 of which provided for the arrangement of mail in the cities of Little Russia on the Moscow model [7, p. 195].

The final unification of the postal system of the Hetmanate (Ukrainian lands) and the Russian Empire took place in the period (1760 – 1789) during the time of Count P.O. Rumyantsev (1725 – 1796), who after the abolition of the hetmanate became the leader of the Left Bank of Ukraine – "commander in chief of the Little Russian regiments". In 1765 he developed an official document "Establishment of horse mail in Little Russia" ("Institution of horse mail in Little Russia") [6, p. 412–413], according to which the

requirements for postmasters were clearly defined, the terms and price list for sending mail were determined. The main routes ("paths") used to deliver mail were also identified. At that time the postal service consisted of 9 routes: Hlukhiv – Kyiv, Kyiv – Poltava, Kyiv – Starodub, Kyiv – Chernihiv, Kyiv – Kremenchuk, Kyiv – Potoky, Kyiv – Dobryanka, Poltava – Chernihiv, Romny – Lubny and seventy–two stations. Subsequently, these routes were established as a basis for the development of auto–roads.

At the beginning of the XVII century, a pair of Western European–style horses was used by various sections of the population in the Ukrainian ethnic lands. At the end of the XIX – in the XX century, the two–horse carriage replaced not only the oxen carriage, but also the traditional one–horse carriage almost everywhere in Ukraine.

The active spread of new types of land transport, especially automobile in the second half of the XX – early XXI century has led to the displacement of traditional vehicles, and at the same time oxen and horses as a traction force for transporting goods. However, even today in the countryside of Ukraine horses are used mainly to move small cargoes on farms.

Among the various types of traditional transport in the Ukrainian lands, one of the oldest in origin was water transport. In the territory of Polissya and the Middle Dnieper region it was used already in the Mesolithic era (12th – 7th millennia BC). Even before the XIX – early XX century, Ukrainians had different means of transportation on the water. The most primitive of them was the raft.

Rafts were used to alloy wood – the main building material – by rivers. On shallow rivers, mostly 2–3 small rafts were joined together. Instead, on high–water rivers (Pripyat, Desna, Dniester) rafting ranges were combined into a so–called "belt" 80–120 m long, and several "belts" – in a "caravan", the length of which sometimes reached more than a kilometer. The movement of forest rafting on the water was controlled by means of oars, and on the rivers of Polissya and Volyn – also long poles.

This method of transporting building materials existed for several millennia, until the second half of the XX century. The last "farewell" raft was fused on August 11, 1979 in Cheremosh. Since then, rafting on Ukrainian rivers has been banned – it has become a thing of history [13].

During the Neolithic era (4th – 5th millennia BC) boats began to be used in Ukraine. The design of the boat has undergone significant changes over the centuries. Later, various small and large vessels occupied an important place in trade and economic relations.

Significant development of shipping underwent during the Princely Era (IX – XIII centuries). In Eastern Europe the largest waterways at that time were:

1) the way through the Dnieper (started in Kiev or, perhaps, higher – in Gnezdovo, went to the mouth of the Dnieper and the Bug, from there to Constantinople), by which the Ruthenian went to Byzantium;

2) the way from the Baltic to the Don and the Volga (starting from Ladoga – Bulgar – Sarkel, went further to the southeast to the shores of the Caspian Sea, from where to the Caucasus or the Middle East), through which trade between Muslim countries, Finnish tribes and ethnic groups of the Baltic coast took place.

The second way was traditional, as well as better known and used [17].

In the XV – XVII centuries, shipping was developed through the Cossack campaigns. Cossack "Chaika" – a ship by which the Cossacks conquered not only the Dnieper, but also the Black and Azov Seas. Sheaves of reeds were firmly attached with a face of linden or wild cherry to its sides. They kept the ship afloat even when water came into it. In calm weather, the "Chaika" overcame the water lake also with the help of a sail. It transported 50 – 70 Cossacks, 4 – 6 guns, barrels of food, drinking water, gunpowder at the same time [2].

Navigation on the Dnieper had significantly revived since the beginning of the XVIII century. On the Desna in the Bryansk city, many wooden ships were built at the new shipyard, which were used for transported cargo in the upper reaches of the Dnieper and its tributaries [12].

The XVIII – first half of the XIX century was the period of intensive canal construction in Europe to create transport links between individual river systems. At that time, canals were being built within Ukraine to connect the basin of the Dnieper, Dniester, Bug and their tributaries with the basins of the Neman, Vistula and Western Dvina. In 1779–1804, the Ogino Canal was built, which connected the Shara River, the tributary of the Neman, with the Yaselda River, the tributary of the Pripyat. During 1797–1800, the Berezina Canal was also built, which connected the tributary of the Dnieper, the Berezina River, with the Western Dvina. In 1775 the construction of the Dnieper–Bug (Royal) Canal (rebuilt in 1837–1840) was completed, which connected the tributary of the Western Bug, the Mukhovets River (Baltic Sea basin) with the tributary of the Pripyat River, the Pina River (Black Sea basin). The first two channels did not last long. The long route of the Dnieper–Bug canal (approximately from Brest to Kobrin) was reconstructed at the beginning of the second half of the XIX century. This channel operates and is used (to a limited extent) for relations with Poland [4].

In the second half of the XVIII century the industrial revolution began in England. The creation and widespread use of the steam engine was its basic factor. In the XIX century steam engines became the main engines for industrial enterprises and transport (steamships and railways). While at the beginning of the XIX century there were several hundred steam engines in the world, at the end of the XIX century the number of steam engines increased to two million. Not surprisingly, this century was called the "age of the steam."

The Frenchman Dani Papen (1647 – 1714) was the first to invent a real steam pump. At the end of the XVII century, he designed a sealed container like an autoclave to sterilize medical instruments. In 1690, Papen connected the boiler he invented with the piston of a water pump. Thus the first steam machine was invented.

In 1804, the English engineer Arthur Wolf patented a double–expansion steam engine (Wolf's high–pressure compound steam engine). The advent of double–acting machines was the next important step in the development of high–pressure steam engines.

At the beginning of the XIX century, a new type of ship appeared – a steamship powered by a steam engine or a steam turbine. A successful attempt was the rowing

steamship "Clermont" by Robert Fulton (New York, 1807). In 1819, the American steamship "Savannah" with rowing wheels crossed the Atlantic Ocean for the first time. In April 1838, the English steamship "Sirius" reached New York [9].

In the first half of the XIX century steamships spread on the rivers of Ukraine. The first domestic steamship was built in 1823 in the Moshny village (now a village in the Cherkasy region). In the Kyiv region, the construction of steamships began on the estate of Prince M. Voronov. Subsequently, these steamships were transferred across the Dnieper rapids and flew between Kherson and Mykolaiv [1].

In 1835 the first steamship company was established, and in 1850 a regular passenger line was opened between Kremenchuk and Pinsk. In 1857, the Russian Society of Shipping and Trade was organized on the lower Dnieper, which included 10 passenger ships and several tugboats. At the same time, new entrepreneurs – the owners of steamships and barges began to appear in Kyiv, Kherson and other Dnieper cities.

In 1906, there were 382 self–propelled and 2,226 non-self-propelled vessels operating in the Dnieper Basin [12]. The development of steamshipping caused the decline and displacement of small and large river vessels of traditional design. At that time, the Dnieper was separated by rapids into two sections, which had a negative impact on the development of river traffic.

With the establishment of Soviet power in February 1918, the Decree on the nationalization of the fleet was adopted. In 1922, the Dnieper River Transport Department was established. In 1923, two river steamshipping companies were established: the Upper Dnieper Company with its center in Kyiv and the Lower Dnieper Company with its center in Kherson. In 1926, they were merged into one – the Dnieper Steamshipping Company.

Later on the Dnieper there were profound economic changes associated with the commissioning of the Dnieper hydroelectric power plant and 3–chamber lock (1932), which created the conditions for end–to–end navigation on the Dnieper [10, p. 13]. In this regard, the transport importance of the Dnieper for the economic development of the Ukrainian republic had increased, hundreds of new steam and non–self–propelled vessels, river ports and piers, shipyards and workshops have been built. During that period, the transportation of coal, mineral and construction and bulk cargo, metals, containers and piece goods increased significantly, the transportation of petroleum products began. Large ports were built on the banks of the Dnieper – Kyiv, Dnipropetrovsk, Kherson. The river port in Zaporizhia was built and equipped with the latest technology at that time.

Before the World War II, river shipping was carried out by two shipping companies: the Dnieper–Dvina Company worked on the upper section to the mouth of the Pripyat, the Dnieper Company – on the middle and lower section. The total length of navigable river routes was 7872 km [10, p. 14].

It should be noted that the entire infrastructure of water transport, which had gained significant economic importance by the middle of the XX century, was destroyed during the hostilities of 1941–1944, World War II, which swept through the territory of Ukraine

in two waves. Almost until the 70s of the XX century, the reconstruction of both inland river and sea transport lasted.

At the time of independence in the early 90's of the XX century Ukraine had a fairly high navigable potential of rivers, the length of waterways, suitable for operation, was about 6.2 thousand km. The main waterways were the Dnieper – 1,205 thousand km (its tributaries Desna – 520 km and Pripyat – 60 km), the Danube – 160 km (the length of the Ukrainian section of the Danube was 160 km) and part of the Southern Bug – 155 km [12].

At the beginning of the 2000s, Ukraine's river commercial fleet was capable for transporting 10 to 12 million tons of cargo annually. Water transport was not inferior to rail and road. However, in recent years, the inland waterways of Ukrainian rivers in terms of guaranteed depths do not fully meet the requirements for safety of navigation. Regular water connections with Belarus in the upper reaches of the Dnieper and Pripyat, traffic on the Desna have virtually stopped, due to the shallowing of these rivers in this region.

The existing infrastructure of river berths (stations) does not meet modern international technical characteristics and standards and is used only for 5–10% of its capacity [10, p. 16]. The vast majority of river ports were founded in Soviet times and are obsolete now. Thus, in Ukraine there is a reduction in the domestic river fleet, its technical aging, critically deteriorating condition of infrastructure, in particular, hydraulic structures.

In Europe, it is more profitable to transport goods by river than by trains or trucks. Thus, in the Netherlands, ships carry one third of all cargo, in Romania – 27%, in Belgium – 18%. In Ukraine it is only 3%. In 2018, the European Investment Bank estimated that Ukraine lost $ 27 million a year, without using the potential of the Dnieper [8].

Modern Ukraine is a maritime state. But in the history of the domestic navy there is no fundamental continuous line. Over the centuries, political changes have led to the periodicity of the development of purely national sea shipping.

Navigation on the Black Sea was carried out in the IV–VI centuries. During the times of Kievan Rus, fairly stable sea connections were established with Byzantium.

The period of XV – XVII centuries is called the period of great geographical discoveries in world history. During that period, European peoples made geographical discoveries in almost all regions of the globe. New lands were discovered and sea routes to Africa, America, Asia and Oceania were laid. Due to the development of navigation, the Europeans radically changed the political, economic and socio–cultural map of the old world.

It should be noted that during that time the access to the Black Sea by the Slavic ethnic group of the steppe zone of Ukraine was limited. In the XIII – XVIII centuries the Crimean Khanate, the Golden Horde, existed on the lands of the northern Black Sea coast. It was a vassal of the Ottoman Empire. However, this did not prevent the Republic of Genoa from creating a whole system of its own cities and trading settlements in these lands. The European commercial presence significantly encouraged the active development of shipping and lively trade in this area in the period XV – XVII centuries.

The significant growth of maritime trade in the cities of the Northern Black Sea and Crimea had little effect on the development of the transport network of the main Ukrainian territory, which was entirely sub–Russian at that time, due to the confrontation between the Russian and Ottoman empires.

Only as a result of Russia's victory in the long confrontation (Russo–Turkish wars of 1768–1774 and 1787–1791), Tatar and Turkish authorities in steppe Ukraine were destroyed, which gave rise to the creation and development of the Black Sea Fleet and port network. Thus, in the 80s of the XVIII century the ports of Kherson (1778), Sevastopol (1788), Odessa (1794) appeared with the inclusion of the Northern Black Sea and the Azov Sea in the Russian Empire [8].

Despite the long history of sea voyages, extensive port infrastructure and the significant contribution of sea transport to the development of the economy of Soviet Ukraine in the early 1940s, seaports and the Black Sea Fleet were almost completely destroyed during World War II. Reconstruction of ports, port cities and the navy began immediately after the liberation of cities from German invaders. Therefore, in the 60s and 70s of the XX century, the fleet and port infrastructure were completely rebuilt and at that time met world standards.

Considering the advantages of maritime transport of modern Ukraine to ensure international trade, it is necessary to note the actual positive characteristics. The Black and Azov Seas hardly freeze and connect with the Mediterranean Sea through the Bosphorus, the Sea of Marmara and the Dardanelles. The total length of the sea coastline of Ukraine is about 2000 km.

Since 1978, one of the world's largest ferry crossings between Illichivsk and the Bulgarian port of Varna with a length of 435 km has been operating. In 1999, the ferry crossings Ilyichevsk (Ukraine, Odessa) – Poti (Georgia) and Varna (Bulgaria) – Poti (Georgia) were put into operation, and in 2004 Ilyichevsk (Ukraine, Odessa) – Derinzhe (Turkey) were introduced in action.

To improve Ukraine's relations with the North Caucasus, a railway ferry across the Kerch Strait was built in 1954 [8]. Prior to the events of 2014 – the annexation of Crimea by Russia – border control was carried out in both ports, there were checkpoints "Crimea" and "Port Caucasus". Due to the Russian occupation of Crimea, the crossing has been subject to US sanctions since August 10, 2015.

At present, maritime transport ranks third in the structure of total cargo turnover in Ukraine after pipeline and rail transport.

In Ukraine, three territorial bodies of maritime transport administration have been established – shipping companies: Azov, Black Sea and Ukrainian–Danube. There are 18 seaports in their system (of which 5 ports of the Crimean Peninsula are annexed by Russia). The largest are Odessa, Chornomorsk, Pivdennyy, Kherson, Mykolaiv, Izmail, Mariupol, Belgorod–Dniester. Odessa region accounts for almost 80% of the processing of all sea freight transport in Ukraine. The main cargoes of sea transport in transportation between ports of Ukraine are mineral and construction materials, coal, metals, machines, sugar, chemical products, etc. Ores, metals, equipment and facilities predominate in

foreign transportation. Seaports interact with land and river modes of transport.

Conclusions. Thus, considering the transformation processes of ancient transport routes and the oldest types of freight transportation in modern Ukraine, it is necessary to note the following.

According to scientists in various fields of knowledge, one of the most important inventions of the ancient world – the invention of the wheel – was made in the last quarter of 5th millennium BC among the peoples of the Trypillia community, whose monuments are located, including in the Ukrainian territories. Archaeological finds indicate a high level of socio–economic development of the tribes of the ancient world who lived in Central Europe between the Carpathians and the Dnieper.

The invention of the first simple mechanism – wheels – allowed to create the first simplest mechanical transmission devices, and hence the first simplest vehicles. In addition, the invention of the wheel contributed to the development of crafts. Later, the wheel was used in the first simple devices that were the predecessors of handicraft tools: a potter's wheel, various spinning wheels for various needs and other tools. The importance of the wheel in the economic sphere was later reflected in the beliefs and symbols of the first peoples, which were passed on to descendants and spread around the world.

But the most important was and remains the primary role of the wheel in the creation of vehicles, which later led to the creation of the first network of European roads. Archaeological sources suggest that as early as 3rd – 2nd millennia BC in Europe, there was a stable network of trade routes: "salt", "amber", "copper", "tin", "silk", etc. Naturally, these paths intersected in the Carpathians, because the Carpathian region at that time was one of the largest deposits of copper, silver and salt in Europe. On the expansion of ancient trans–European routes in the early 1st millennium AD ancient Greek and Roman written sources testify.

Recognized and stable transport routes have always contributed to the development of trade, and hence to the economic development of certain territories, which directly determined the political state of these territories. However, over the centuries, the political situation changed, the first state formations appeared and disintegrated, which, along with natural factors, influenced and solved the changes in the trans–European transport network. In the Middle Ages, the European transport network inherited the continental "amber" and "tin" routes, the sea routes of the Baltic, Mediterranean and Black Seas.

The invention of the wheel, the appearance of the first vehicles, respectively, the presence of suitable animals – oxen – led to the emergence of animal transport in Ukraine in 5th – 4th millennia BC. One of the oldest modes of transport – animal transport with the traditional pair of oxen – existed in Ukraine without radical changes until the XIX century, and in the XV – XVIII centuries, thanks to Chumatstvo, gained significant commercial importance in the region’s economy. In Ukraine, horses have been used as a traction force only since the 16th century. This type of animal transport gained rapid development and significant importance in the XVII – XVIII centuries and, like the pair

of oxen, was replaced in the first half of the XIX century by the development of railways.

The history of cargo transportation development in the Ukrainian lands has been formed for several millennia. The oldest were water river and animal transport. Inland freight transport has historically been the basis of the economy and trade in Ukraine.

It should be noted that waterways by rivers, water transport (rafts and boats) began to be used by ancient man, including in Europe, earlier than land wheeled vehicles. Naturally, the territories, and, above all, the rivers of the modern Ukrainian lands have been part of the common European transport network since ancient times.

The simplest water vehicle – raft was used in Ukraine from 12th – 7th millennia BC. Transportation of wood by rafts ceased to be used only in the second half of the XX century.

BC Boats began to be used in Ukraine in the 7th–5th millennia. A fairly dense network of large waterways: the Dnieper and its tributaries Desna and Pripyat, the Danube, the Southern Bug and a network of small rivers have been an essential basis for the development of navigation in all historical periods in these areas.

It is worth identifying several periods when shipping became extremely important in the transport system not only of Ukrainian lands, but also trans–European system. During the Princely Era (IX – XIII centuries) the Dnieper played an important role both in the formation of Kievan Rus, and in its rise, gaining power and world recognition. The second significant period should be called the XVIII – first half of the XIX century – a period of intensive construction of canals, including in Ukraine, when separate river systems were combined into a single transport network in Europe. The third important period of river navigation in Ukraine, as well as in the world, can be considered the XIX century, when thanks to the invention of the steam engine steamships were created. The development of shipping in the first half of the XIX century became important and created significant competition for other modes of transport.

The rapid development of various modes of transport in the XX century, global trends in climate change (warming), the negative anthropogenic impact, the shortcomings of national governance led to the decline of inland water transport in Ukraine in the early XXI century. At present, the process of revival and development of Ukraine's maritime transport infrastructure is underway. The maritime and river transport sector is of strategic importance not only for the economic development of the country, but also for the development of international cooperation. Currently, Ukraine is in the process of developing water transport and integrating it into the priority European transport network. Prospects for further exploration include the study of the impact of transport on the development of Ukraine’s economy and the realization of its transit potential.

References:

1. Andronik V. (2018) Revolyutsiya na vodi: yak Ukrayini zarobyty na richkakh. [Revolution on the water: how Ukraine can make money on the rivers]. Retrived from: https://www.segodnya.ua/ua/economics/transport/revolyuciya–na–vode–kak–ukraine–

zarabotat–na–rekah–1136749.html [in Ukrainian].

2. Hlushko M.S. (2018) Ukrayina, derzhava: transport // Entsyklopediya istoriyi Ukrayiny: Ukrayina – Ukrayintsi [Ukraine, state: transport // Encyclopedia of the History of Ukraine: Ukraine - Ukrainians]. Book 1. – Kyiv: Naukova Dumka. 608 p. [in Ukrainian].

3. Dmytriienko M.F. (2003) Velykyy shovkovyy shlyakh // Entsyklopediya istoriyi Ukrayiny: Vol. 1: A–B [The Great Silk Road // Encyclopedia of the History of Ukraine: Vol. 1: A – B]. Kyiv: Naukova Dumka. 688 p. [in Ukrainian].

4. Ihnatieva T.V. (2005) Torhovel′no–ekonomichni zv'yazky Pravoberezhnoyi Ukrayiny naprykintsi XVIII – 50–ti roky XIX st.: Avtoref. dys... kand. ist. nauk: 07.00.01. [Trade and economic relations of the Right Bank of Ukraine in the late XVIII – 50th of the XIX century: Abstract dis ... cand. historical sciences: 07.00.01]. Chernivtsi. 20 p. [in Ukrainian].

5. Wheel. From Wikipedia, the free encyclopedia. Retrived from: https://en.wikipedia.org/wiki/Wheel [in English].

6. Bezborodko A. A., Ruban V.H. (1777) Kratkaya letopis' Malyya Rossii [A Brief Chronicle of Little Russia]. St. Petersburg: Kh. F. Klen Publishing House. – 450 c. [in Russian].

7. Velychko Samoyl (1851) Letopis' sobytiy v Yugozapadnoy Rossii v XVII veke [Chronicle of events in Southwestern Russia in the 17th century]. Vol. 2. Kyiv. 612 p. [in Russian].

8. Sea and river transport of Ukraine // Information and reference site "Ukraine". Retrived from: http://proukraine.net.ua/?page_id=469 [in Ukrainian].

9. Steamship. From Wikipedia, the free encyclopedia. Retrived from: https://en.wikipedia.org/wiki/Steamship [in English].

10. Pidlisnyi P. (2016) Vnutrishniy vodnyy transport: istoriya, problemy, napryamy rozvytku [Inland water transport: history, problems, directions of development] // Ekonomist. №1 (January). P. 10–20. [in Ukrainian].

11. Rezepkyn A. (2011) «Rossiyskoye otkrytiye»: koleso izobreli ne na Vostoke ["Russian discovery": the wheel was not invented in the East] // Moskovskiy komsomolets. Retrived from: https://www.mk.ru/science/2011/06/16/597841–koleso–izobreli–ne–na–vostoke.html [in Russian].

12. Semenukha R. (2017) Richkovyy transport Ukrayiny: vyydemo na vodu chy syademo na milynu [River transport of Ukraine: let's go out on the water or go aground] // Dzerkalo tyzhnya. Retrived from: https://samopomich.ua/richkovyj–transport–ukrayiny–vyjdemo–na–vodu–chy–syademo–na–milynu [in Ukrainian].

13. Sokur Yu.V. (2011) Pravovi osnovy torhovel′no–transportnoho pidpryyemnytstva v Ukrayini (na materialakh chumats′koho promyslu KHVII – KHIKH st.): dys… kand. yuryd. nauk: 12.00.01. [Legal bases of trade and transport entrepreneurship in Ukraine (on the materials of the chumak's industry in the XVII - XIX centuries): Dissertation … jurid. science: 12.00.01]. Kyiv. 178 p. [in Ukrainian].

14. Tomenchuk B. (2009) Bavars′kyy Heohraf i richkovi shlyakhy ta grady v