KLIRONOMY:
the science of cultural heritage

ART & CULTURE

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KLIRONOMY:
THE SCIENCE OF CULTURAL HERITAGE

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The book includes a revised and expanded first edition of the monograph on a new scientific direction on cultural heritage. The work describes the relevance of creating a complex of Sciences of Klironomy, the history of forming the world cultural heritage, the types of its preservation, and a complete description of the methodological apparatus of all klironomic sciences, combined into three logical directions – tangible, intangible and theoretical. In conclusion, the author presents the passport of the specialty developed him. The references list 32 scientific works of the author and developer of cultural heritage science for 2012-2023, such as 318 scientific works, reseraches, scientific articles and information sources.

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About the author

Alexander Buychik is a specialist in cultural heritage (MCH), a Doctor of Economics, PhD in Social and Political Sciences, and a Bachelor of Education in Geography. He also specialises in management, marketing, computer graphics and web design. He began his scientific and professorial activities at the higher school in 2005 after 10 years of teaching. Until 2019, he was an associate professor at several St. Petersburg universities. He also participated in creating and developing a private university of culture and arts, where he held the positions of vice-rector for science, head of scientific direction, and leader of scientific publishing for various years.

Since 2012, the author has begun scientific research to create an apparatus for forming the science of restoration. Two years later, he concluded that the need to create a full-fledged complex of sciences on cultural heritage was actualised at the present stage of developing science and the state of world society.

For several years, the scientist alone conducted a huge complex of research, which, in the future, turned into a fundamental scientific work on creating a new complex of cultural heritage sciences. The research results have been presented in numerous scientific articles in Russian scientific journals.

During the development of the cultural heritage sciences complex, the author also became the leader of the scientific group of another project, within the framework of which a complex of psychological cultural studies was developed. The project's results were published in the scientific journal of mini-monographs "Internauka" in 2016.

By 2019, the author has prepared a complete dissertation study on the relevance and formation of a new complex of sciences on cultural heritage and its preservation. The work was submitted to several dissertation councils in Russia. However, he was denied the topic because, by Russian standards, it was written at the level of a doctoral dissertation and went beyond the limits and rules of scientific topics in culture in the country. The proposed alternative topics were far from the direction of the scientist's work. He was also accused of claiming a volume of work that corresponds to the developments of a research centre or university.

In those years, repression and persecution of Russian scientists with international academic degrees also began. As a result, the author left Russia's university world and focused on continuing to conduct business seminars and specialised training courses in economics, management, and layout, which he has been developing and implementing in various training centres since 2011.

In 2019, the French-German academic publishing house Lambert proposed publishing the first version of his scientific monograph in English on a new set of sciences. Thus, the world saw the first fundamental work on Klironomy, based on a dissertation study manuscript.

The author was forced to leave the Russian scientific world in the same year. In 2020, together with Mgr. Anisiia Tomanek, he founded the Tuculart Holding in

the Czech Republic, which began to deal with issues of science and scientific journalism. The world's first interdisciplinary scientific journal, "European Scientific e-Journal", was founded in the same year. In 2021, they founded the second international scientific journal, "Klironomy", specialising in culture, art and cultural heritage, and Tuculart Edition, specialising in scientific publications. In 2022, Tuculart Holding organised the third international scientific journal, "Tuculart Student Scientific", specialising in student scientific works. Today, all three scientific journals are operated by the European Institute for Innovation Development (EIID), founded by Tuculart Holding, to develop and popularise European science and promote the Czech Republic in the international scientific world.

During the Russian period of scientific and practical work, the author created and published the study on the economy, politics and philosophical thought of Italy's civilisation space (2004, 2006, 2016), the evolution of Italian monopolistic market in the second part of the 20th century (2007), theory of wave dualism of power (2015), history of society and democracy in five books (2019). After the Russian period, he published basic principles application of the ABC methodology in human resource management at the enterprise, developed in 2011-2020, and a joint study on new mathematical methods and algorithms for determining the financial stability area (2022, 2023).

Like many Russian scientists, the author left Russia in protest against the war in Ukraine. He now lives in Serbia and continues his active international scientific activities, helping Ukrainian scientists despite the hardships of migration and the politicisation of science.

Opening remarks

Each new generation of mankind "stands on the shoulders" of the previous generations. It stands in the sense that each new generation comes into this world not to an empty place but to a place prepared by hundreds of previous generations. Since childhood, each new generation grows and develops in the bosom of a spiritual culture cultivated and created at a given historical moment. Spiritual culture is an extensive-scale system of spiritual values, norms, and principles accumulated by mankind over many thousands of years. Moreover, in this sense, the task of each new generation is to preserve and enhance all this colossal wealth of spiritual culture accumulated by our predecessors. Moreover, civilisation's material and spiritual progress depends on the degree of preservation and multiplication of this polyphonic wealth.

The history of mankind knows numerous examples of not only carelessness but also barbaric attitudes towards the cultural heritage of previous generations and cultures. Thus, any religious reform, the victory of a new religious teaching, was most often accompanied by the destruction of the artefacts of the defeated religious teaching. For example, the victorious Christianity in the fourth century made many efforts to eradicate the ancient world's science, religion, philosophy, literature, and architecture. Millions of volumes of books were burned at the stake of the Third Reich. There are countless examples of this. Today, in the 21st century, when humanity has finally accumulated the socio-economic resources to create a unified world, the problem of preserving and enhancing the cultural heritage of the past is becoming particularly acute. When humanity finally learns to take extreme care of its cultural heritage, it will mean that the human element in man will finally begin to overcome the animal element. I believe it is only on this path that humanity can build a bright, harmonious, and happy future.

In this regard, Alexander Buychik's new book, offered to the reader, contributes significantly to understanding the significance of the issue being raised, and its beautiful and precise language convinces us that it will find thousands of readers who will read it with great interest.

Maksim V. Bakhtin
Doctor of Philosophy, Professor
President of the International Business Professors Club

Cultural heritage is key to developing modern world civilisation, linking the past, present, and future. It embodies the experience of previous generations, accumulated knowledge, values and traditions that shape our identity, strengthen mutual understanding between peoples and serve as the basis for the sustainable development of society.

In recent decades, increasing attention to preserving cultural heritage has stimulated the development of new scientific approaches and disciplines. One of these innovations was the science of Klironomy, developed by Alexander Buychik. This discipline studies heritage as a holistic system, integrating approaches from history, cultural studies, anthropology, economics, and ecology. Klironomy aims to identify, preserve, use and transmit cultural heritage to future generations, considering modern challenges such as globalisation, urbanisation and climate change.

Klironomy offers a new perspective on cultural heritage, considering it not only as an object of protection but also as a resource for developing society. This approach helps balance preserving heritage's uniqueness and adapting its use in a changing world. Alexander Buychik's scientific ideas are already being applied in various fields, including the development of sustainable tourism programmes, the creation of innovative educational projects, and the formation of policies to preserve cultural heritage.

Thus, cultural heritage, combined with the new approaches offered by Klironomy, becomes a repository of human memory and a powerful tool for forming a harmonious and sustainable global civilisation.

Sergey Lebedev
Doctor of Philosophical Sciences, Professor
Head of the Department of Philosophy and Social Sciences
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Introduction

Preserving civilisation's cultural heritage is the most relevant and priority development direction for the world community as a whole and the societies of each state separately. It is impossible to imagine humanity's progress without understanding its primary sources and the development of culture throughout all epochs (eras) of the formation of the modern image of society. It is necessary to understand the result of changes in society throughout its evolution in the temporal dimension as the current state of society for each moment.

The cultural image of a society cannot be formed from nowhere. It results from centuries, i.e., old transformations, diffusions, and interpenetration of semiotic series, traditions, and folklore, the formation of intangible cultural heritage, and its transfer to the material shell in its essence. This begins to form the concept of the value of heritage, first in economic perception (equivalent) and then spiritual, that is, the value of the past for society in the future.

The term "klironomy" was developed based on the Greek word κληρονομιά [klirɔnɔmˈɲa] or [klironomia], which means literally "heritage". Heritage is the phenomenon of culture and life of people left over from the old days. Therefore, using this Greek word to refer to the whole science of cultural heritage preservation is legitimate and logical.

Klironomy, or Klironomia, as a science of cultural heritage preservation, is called to combine all the knowledge, skills and abilities in the field of conservation, restoration, renovation and revitalisation of objects and items of tangible cultural heritage, like the areas of the development of intangible cultural heritage. Over the last centuries, people have developed a large number of theoretical, practical and methodological materials, which served as the basis to form klironomical scientific way allocated on the border of cultural, art, social, humanitarian and historical sciences with signs of cross-border with the natural sciences (chemistry and physics) and philosophy. Philosophical thought plays a significant role in forming the spiritual foundation for understanding society's values, heritage and culture. No scientific direction or science can be selected and get the justification of its segmental existence without philosophical justification, of course.

Today, in the American and European sciences, there is the scientific direction of "Conservation and Restoration", in which the logical emphasis is placed on conservation as a science of preservation of objects and items of cultural heritage (*Sandis, 2014*). Within the framework of conservation science, the spiritual component of cultural heritage is not considered. The methodology for preserving tangible heritage, i.e., objects and items of culture and art of the past, is being developed only. However, cultural heritage implies the preservation of intangible and tangible heritage.

Philosophers have considered the value problem since Antiquity: Socrates, Plato, Protagoras, Aristotle, Francis Bacon, David Hume, and Immanuel Kant introduced new qualitative characteristics to understand the value of tangible and intangible things in the Modern Era. Wilhelm Windelband and Heinrich Rickert introduced the concept of "value" into philosophical science, and Max Scheler

and Nicholas Hartmann substantiated the theological doctrine of values. In the 19th century, the notion of value began to grow and engage itself in various social activities. Therefore, there was an understanding of "cultural value", which philosophers such as Emile Durkheim, John Dewey, Friedrich Wilhelm Nietzsche, Talcott Parsons, Ralph Barton Perry, Clyde K. Kluckhohn and Fred Strodbeck expanded in their writings at the end of the 19th century and the first half of the 20th century.

The German romantic Johann Gottlieb Fichte, the Slavophiles, in particular, the collector of songs Peter Kireevsky, and the collectors of epics Alexander Gilferding and Pavel Rybnikov made a unique contribution to the understanding of folk culture as the basis of identity.

To date, no works of the klironomical direction can fully reveal the significance and depth of a comprehensive philosophical view to preserve intangible and tangible cultural heritage as a whole within a separate scientific direction.

The formation of the scientific direction of "Klironomy" and the definition of criteria of the klironomical sciences became possible based on the evolution of philosophical thought and understanding of the relevance of cultural heritage preservation, the development of conservation, restoration, renovation and revitalisation in the theoretical, practical and methodological directions, the formation of clearly defined areas of social activities to preserve and restore tangible and intangible heritage in various fields of the science, like the need for the structural definition of a place of cultural heritage preservation in the system of the sciences for the further social and economic development of this area.

Chapter 1

Historical and Philosophical Review of Developing Klironomical Views

Cultural heritage is a part of the tangible and intangible culture created by past generations and the klironomical basis of society (*Buychik, 2018a*). In this chapter, we consider the temporal change in the klironomical worldview of the society for the historical and cultural heritage of past civilisations, which forms the level of the society.

Many drawings, buildings, statues and household items have been created over the last 12 thousand years of human history. We find rock paintings in caves and grottos, the settlement of which took place tens of thousands of years ago. Archaeologists discovered presumably the oldest petroglyphs in the history of humanity, about 40 thousand years, on the island of Sulawesi in the autumn of 2014 (*World's oldest cave paintings…, 2024*). The first urban settlements dating of which are officially recognised by archaeologists belong to the 8th millennium BC. Among them, the settlement of Jericho, or Ariha in Hebrew, is particularly distinguished. It is located on the West Bank of the Jordan River. The first traces of human life in it belong to that period. The oldest city fortifications were dated by no later than 6800 BC, which was the beginning of the 7th millennium BC (*Strutin, 2001*). Damascus, the modern capital of the Syrian Republic, rivals Jericho by the age of construction of urban structures. The excavations on the outskirts of Tel Ramad indicate that the territory of modern Damascus was inhabited in the 9th or 10th millennium BC (*Neolithic Tell Ramad, 2001*). Thus, it is possible that Damascus is the oldest urban settlement on the planet. However, it was not a significant settlement in the region until the invasion of the Arameans around 1400 BC. The city of Byblos, the territory that was inhabited in the 7th millennium BC, is also among the oldest permanent human settlements. However, it is only known as an urban settlement from the 3rd millennium BC (*Ciasca, 2001*). Another settlement is Göbekli Tepe, which was discovered in 1994. According to archaeological data, it was also built around the 7th millennium BC (*Mann, 2011*; *Clare, 2020*). On the other hand, scientists do not know its size and significance at that time; it is still an open question.

The ruins of the most ancient known settlement of Jericho, or Ariha in Hebrew

However, there is a long-term dispute among archaeologists, historians, cultural scientists, and art historians about the historical and cultural heritage of the past.

The laws of individual states and UNESCO regulate dating relatively recent objects – buildings, sculptures, arts and crafts and paintings. For example, the objects of historical and cultural heritage (monuments of history and culture) of the peoples of European countries include immovable property (and objects of archaeological heritage) and other objects with historically associated territories, works of painting, sculptures, arts, objects of science and technology, and other objects of tangible culture that have arisen as a result of historical events that are valuable from the viewpoint of history, archaeology, architecture, urban planning, art, science and technology, aesthetics, ethnology or anthropology, social culture and are evidence of eras and civilisations, trustworthy sources of information about the origin and development of culture (*Treaty of Lisbon…, 2007*). However, determining the significance of the object or items of the past remains absolutely subjective, at the discretion of the expert commission at the relevant ministry of each country. Those objects and items of the past, defined as cultural heritage, are ranked by world, national and regional significance.

At the present stage of society's development, since the adoption of the Athens Charter by the International Council of Museums in 1931, many regulatory documents have determined the nature and category of cultural heritage objects. If the heritage of the past had been determined in different civilisations in different ways for decades or centuries before.

The first officially known save the object as a particular social, political or cultural value of civilisation, i.e., the historically proven fact of the birth klironomical worldview, is a message about the recovery of the Great Sphinx in Giza Valley from the sand (*Buychik, 2014c*). The first mention of the work on the Great Sphinx dates back to about 1400 BC. An inscription preserved on the stele of the reign of Thutmose IV built between the two legs of the Great Sphinx. It says that the king's son Thutmose went hunting in the valley of the gazelles, where Hor-em-Aht spoke to him in a dream and asked on behalf of Harmahis to free him from the sand in exchange for the crown of Upper and Lower Egypt (*Grimal, 1992*). By that time, the monument was almost entirely immersed in the sand. According to paleo-climatic studies, it could occur for not less than 1000 years of desolation of the object. Therefore, the Great Sphinx was created no later than 2500-2400 BC.

The meaning of the stele of Thutmose IV was that he freed the object from the sand, cleaned it, and brought it into the proper form; thus, he became the next Pharaoh after a short time. Archaeological evidence confirms that Thutmose performed large-scale and expensive work. The preserved remains of raw brick walls with an inscription of the name "Thutmose" prove that the rehabilitation work was performed according to the information on the stele. Also, preserved blocks were similar to those used by Khefren in the dam's construction, which narrows the historical framework and proves the veracity of the available information on the stele.

Thus, the first well-known restoration and conservation works of klironomical character were in the reign of Pharaoh Thutmose IV and consisted of three main stages:

(1) Cleaning the monument from the sand. The Great Sphinx was probably cleaned thoroughly despite some sources' claims. It was significant from the point of view of the restoration of the whole appearance of the deity and the point of view of the greatness of power and cult.
(2) Construction of the walls around the Great Sphinx to protect it from the physical effects of wind and sand. The monument extended its existence thanks to the walls, although the wind and mechanical erosion continued, albeit in smaller volumes. Today, it is considered controversial what form of the Great Sphinx would be better preserved – under the sands or behind the walls.
(3) Restoring the damaged parts of the monument involves returning the breakaway parts bonded cementitious composition in the monument's volume (*Grimal, 1992*).

The monument of Sphinx in Giza Valley

It was a good example of restoration work, i.e., the complex klironomical events. In fact, the date 1400 BC can be considered the oldest documented mention of the restoration work, which significantly pushes the historiography of scientific and practical courses today. Of course, we can find other documents of earlier conservation or restoration of some objects in the first civilisations in the future. This fact will help us to move the date of the first recovery in the depth of human history further.

However, the notion of preserving the values of the past and their destruction was in a kind of symmetry throughout the history of the world's most significant civilisations. In fact, preservation and vandalism in various forms existed in all ages of human development, showing a struggle between the opposites: klironomy and vandalism. The Ancient Egyptian pharaohs brought down their troops on the territory of the Nubian Kingdom, plundering and destroying numerous temples, which were done in response to the rulers of Nubia. Despite

mutual vandalism, the rulers of the kingdoms of Ancient Egypt, Nubia, the Sumerian-Akkadian Kingdom, etc., hold contradictory policies concerning the objects of their cultural heritage, too. They destroyed steles, statues and frescoes of some past undesirable rulers for internal policy, and at the same time, took care of the most significant monuments that had sacred meaning for civilisation. Also, we have some information about the restoration work in the Ancient Egyptian and Sumerian-Akkadian towns.

Thus, there was a conditional klironomical concept of recovery works, which historically coexisted alongside the vandalism in the era of the ancient kingdoms.

The term "vandalism" was formulated at the end of the 18th century and refers to the time of the French Revolution. This term was first used by Abbot Henri Gregoire, a member of the National Convention, in the modern sense in his "Report on the destruction caused by vandalism, and the means to prevent them" in 1794 (*Reau, 1959*). He called for the fundamental suppression of attempts to destroy monuments of art. The term comes from the name of the East German Union of vandal tribes that looted Rome in June 455. They had no relation to the tribes of the wends, the Western Slavs. However, the information has become a persistent cliché since the 8th century, when it appeared in the writings of Western chroniclers mistakenly or intentionally (*Francovich, 2002*). Vandalism is one of the forms of destructive deviant behaviour of a person, during which objects of art and culture are destroyed or desecrated. English sources draw attention to the legal aspect of vandalism: "Vandalism is an action involving deliberate destruction or damage to private or public property" (*Vandalism, 2014*). According to the encyclopedic dictionary of Brockhaus and Efron: "Vandalism is wild, merciless robbery, barbarism" (*Vandalism, 1891*).

As the destruction of objects of the past of different cultural values, vandalism can be classified by the vandalism motivational typology of S. Cohen:

- method of acquisition;
- tactical;
- ideological;
- vengeance (*Cohen, 1973*).

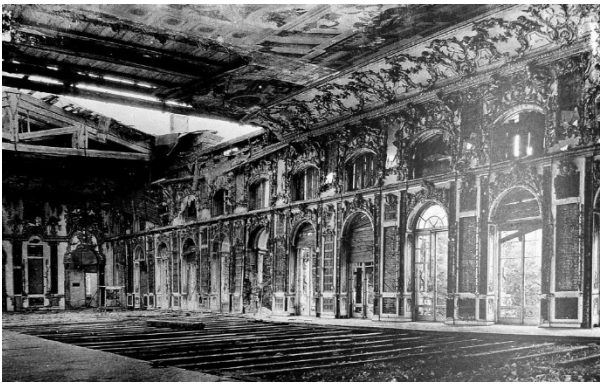
The practice of vandalism was peculiar not only to the tribes of vandals and barbarians who did not perceive the values of antiquity of Ancient Greece and Ancient Rome by diametrically opposed views on religion. The rejection of Muslim Arabs by other cultures can be considered a particularly striking example of vandalism. In 641, Caliph Umar Ibn al-Khattab ordered the commander Amr Ibn al-Asuh to burn the Library of Alexandria, specifying: "If these books say what is in the Koran, they are useless. If they say something else, they are harmful. Therefore, in both cases, they must be burned". So, the first known fact of the burning of the Library of Alexandria by the troops of Julius Gaius Caesar in 47 BC can be attributed more to the category of "accident" because the purpose of the capture of the city was the shipyard and warehouses of bread, the looting of the city in 216 AD by the Emperor Caracalla troops already referred to the

method of acquisition, then the vandalism of the Arabs-Muslims referred to ideological.

Ideological vandalism based on Islamic religious fanaticism is the most terrifying among others. In most cases, this form of vandalism results in the complete loss of objects and items of cultural heritage. We can give two examples:

(1) destruction of the giant ancient Buddha statues in Afghanistan and the exhibits of the National Museum in Kabul by the Taliban terrorist movement in 2001;
(2) destruction of archaeological monuments of the ancient cities of Palmyra, Nimrud, and Khatra, monuments of Sumerian, Assyrian and Babylonian art, stored in the Museum of Mosul by militants of the terroristic "Islamic State" in 2014-2016.

Ideological vandalism based on fascist ideology also showed extreme forms of cultural heritage rejection, interspersed with the method of acquisition in the form of seizure and appropriation of "alien" heritage. During the Second World War, German troops destroyed and looted dozens of palace and park ensembles and thousands of cultural heritage objects in Eastern Europe and the Western republics of the Soviet Union, including most of the objects of wooden architecture, the palaces and cathedrals of Warsaw, Prague, Kyiv, Smolensk and the suburbs of Leningrad (now St. Petersburg). The components of the unique Amber Room, the famous masterpiece of 18th-century art taken out by fascist officers from the Grand Catherine Palace of Pushkin (St. Petersburg), have not been found till now.



The Grand Catherine Palace in Pushkin District Pushkin of Leningrad City (now St. Petersburg) after bombings of German Army in 1941-1942

For a long time, the attitude toward cultural heritage was indifferent in the Middle Ages and the Renaissance. The beginnings of the world's klironomical outlook on society waned. We can see hundreds of paintings by Dutch, German, French and Italian artists of the 15th-18th centuries who depicted colourful landscapes and scenes of the life of the different social segments in front of the ruins of past eras, mainly Ancient Roman and Ancient Greek buildings and statues. There is no

documentary evidence of large-scale measures for the preservation or recovery of objects except the beginning of the restoration of the Sistine Chapel frescoes in 1565, 53 years after their creation. Objects and items of heritage were not generally destroyed but left in oblivion, which can be interpreted as ideological vandalism. The periods of the 5th-8th and 15th-18th centuries there was observed as ice ages, which were accompanied by unstable climatic conditions and the common cold in Europe; it should be noted that the vast majority of objects received irreparable damage and were practically lost to future generations.

There was a sharp change in values concerning ancient culture in the Middle Ages. In 529 AD, Emperor Justinian closed the Platonic Academy in Athens, which lasted about 900 years. The ban on paying salaries to teachers of rhetoric and grammar led to the relatively rapid closure of most schools of the Athenian type. In addition, pagan temples began to be closed promptly; their property was selected in favour of the treasury. The tangible cultural heritage of antiquity underwent a complex non-tangible transformation adapting to the doctrine of Christianity. At the everyday level, for example, there was a gradual transformation of pagan holidays renamed in the Christian way – New Year, Maslenitsa and others. The "free arts" of antiquity – grammar, dialectics, rhetoric, arithmetic, geometry, astronomy and music – also transformed. Secular knowledge in the Middle Ages was recognised as secondary, subordinated to the study of the Bible and Christian dogma. Aesthetic education, declared a "spiritual abomination", was considered unacceptable especially. Those klironomical beliefs have been the basis of the intangible cultural heritage of antiquity, artificially and methodically eradicated.

Therefore, we can assume that Earlier Christianity, taking a strong stand against "pagan" antiquity, used the tools of vandalism in the Middle Ages – in the literal and conventional sense. Within Europe, the intangible cultural heritage of the past was transformed, and the tangible heritage was ignored or destroyed, e.g., numerous works of ancient philosophers. However, outside the European space, Christian missionaries and crusaders were not humanistic at all and were not limited to simply ignoring the "alien" cultural heritage. During the Crusades, which began after the announcement of the policy of the return of the Holy Land by Pope Urban the Second at the Clermont Cathedral in 1095, many temples were burned, and dozens of fortresses were destroyed. For example, during the First Crusade down the Danube River, the participants looted and devastated Hungarian lands and then engaged in vandalism in Constantinople. In total, 21 Crusades were organised for 350 years, from 1096 to 1444. As a result, South-Eastern Europe and the Middle East lost many cultural heritage items of the peoples inhabiting these territories.

The Renaissance was marked by a new cultural paradigm that emerged due to fundamental changes in social relations in Europe and their rethinking. The concept of "renaissance" was introduced by Giorgio Vasari, the Italian painter and art historian of the 16th century, who gave the representatives of the Italian art of his era as people who managed to revive the antique tradition, "cast down

to their extreme own destruction" in his book "The Biography of Famous Painters, Sculptors and Architects" in 1550.

This era was divided into 4 periods:

(1) Proto-Renaissance, or the Later Middle Ages;
(2) Early Renaissance;
(3) High Renaissance;
(4) Later Renaissance.

In art, a return to the values of antiquity occurred only in the 15th century. Hence, the proto-Renaissance had no impact on European civilisation from the viewpoint of cultural heritage revaluation. In addition, the Crusades continued until the middle of the 15th century, and the influence of the Christian Church on the social and spiritual life of Europe was highly significant. Conventionally, the beginning of the Renaissance relates to the Passover on April 8, 1341, when the Senate of Rome awarded Francesco Petrarch by Laurel wreath for achievements in the arts. However, it was only an episode that probably served as an exception to the period of the proto-Renaissance rather than the natural crown of the transformations that began in the 2nd half of the 13th century with the flowering of Gothic architecture.

The Renaissance did not fundamentally change society's views on the cultural heritage. To be more precise, architecture, sculpture, and then painting began only to apply the achievements of ancient art. However, the objects and subjects of the cultural heritage of the past in Europe remained neutral for a long time. Significantly, the behaviour of the conquistadors and the first settlers in Central and South America on the cultural values of the local peoples – the Mayans, Aztecs and Incas – contrasted with the ideals of the Renaissance. Barbarism (in figurative rude, barbarism is wild, uncultured, uncivilised behaviour) and outdoor vandalism of the Spaniards, as a form of anti-klironomical outlook, led to the fact that the ancient civilisations were looted, their many values either rated, i.e., exported to Europe or disappeared. The Treaty of Todesillas of 1494 legalised the seizure of any values of New World civilisations in favour of the Spanish treasury. Although, in 1573, Philip the Second issued the "Ordinance on New Discoveries", which imposed a direct ban on any robbery and forced conversion to Christianity, the document did not protect the peoples of America from the seizure of values. Piracy and storms have become reasons for the historical loss of part of the exported cultural heritage of the Indian people.

The Mayan, Aztec, and Inca tribes began to decline, losing their intangible cultural heritage, which they had accumulated and preserved for centuries. The cities fell into decay and desolation. From the point of view of science and heritage restoration over the next centuries until the 20th century, nobody was interested in abandoned cities.

In the next periods, the Portuguese successfully adopted and applied the principles of barbarism during the colonisation of the territory of modern Brazil and the British during the seizure of the territories of North America.

In historical retrospect, the Renaissance showed that from "the heights of artistic achievements of the Renaissance, which make up the Golden Fund of human heritage, social and economic achievements, surpassed by subsequent development, fade and appear not as determining reasons, but only as a concomitant external environment" (*Suniagin, 1985*). This was reflected in the attitude to the cultural heritage: klironomical views revived. The construction of new cathedrals, temples, churches and buildings was accelerating; the wealthy clans rushed into the race to position their capital – orders for statues, paintings, and interior decoration. For example, for 300 years of prosperity, one of the most famous and wealthiest families in Europe – the Medici – financed the construction of such facilities as:

- three palaces – the Palazzo Vecchio sculptor and architect Arnolfo di Cambio (1299-1314) (*Tomasi, 2007*), Palazzo Medici Riccardi architect and sculptor Michelozzo di Bartolomeo (1444-1460) (*Ferrara & Quinterio, 1984*) and the Palazzo by the architect and sculptor of Florence Filippo Brunelleschi (1458-1464) (*Fanelli, 2004*; *Fanelli, 1980*);
- two medical chapels in the Church of St. Annunziata by the same M. di Bartolomeo (*Oesterreich, 1774*) and New Sacristy in the Church of San Lorenzo Michelangelo Buonarroti (*Erpel, 1990*);
- two villas – Villas Pratolino designed by the artist, theatre architect and stage designer Bernardo Buontalenti, and Villa Medici in Rome by the architect and sculptor Bartolomeo Ammanati (1576) (*Pirri, 1943*; *Kinney, 1976*).

It is worth noting that all of the above architects were famous and were leaders in Italian schools. In addition, the Medici family attracted orders of paintings, bas reliefs and sculptures of such famous masters as:

- Andrea del Verrocchio (real name was Andrea di Michele Cioni) did the tomb of Cosimo de' Medici (1465), the sculptural group "Conviction of Thomas" (1476-1483), the tomb of Piero and Giovanni de' Medici sketches of standards and knightly armours for the tournaments of Lorenzo de' Medici, the sculpture "Boy with Dolphin" for the fountain of the Villa Medici at Careggi;
- Sandro Botticelli (real name was Alessandro di Mariano di Vanni Filipepi) painted a banner for Giuliano de' Medici, the picture "Adoration of the Magi"; there were the members of the genus (1475-1478), the portrait of Giuliano de' Medici, "Pallas and the Centaur", "Spring" and others;
- Benozzo Gozzoli (real name was Benozzo di Lese di Sandro) did the frescoes in Palazzo Medici-Riccardi;
- Luca Giordano did the frescoes in Palazzo Medici-Riccardi;
- Pontormo (real name Jacopo of Carucci) did the painting of Villa di Medici in Poggio a Caiano (*Conti, 2002*; *Conti, 2007*; *Zuffi, 2006*).

Huge funds were attracted from the savings of the wealthiest clans to create a new one, as seen from the list of creators who worked for members of the Medici family during the Renaissance. However, at least it was not restoration or

maintenance of the old one. It led to the foundation of the future of the rich cultural heritage. However, it did not contribute to the emergence of a scientific klironomical understanding of the heritage of the past. The architects, sculptors and painters of the Renaissance turned to the achievements of the art of antiquity with great enthusiasm. However, it was no longer. Imitation and copying were not associated with restoring the existing fund of the objects and subjects of antiquity and earlier eras.

From the 11th to 14th centuries, this attitude could be traced in almost all European countries. Analysis of the composition of the stone walls of the medieval fortresses and churches of Kyiv, Novgorod the Great, Pskov and other cities shows that repair and restoration works were performed throughout the centuries. However, they also had the character of literal maintenance of objects in proper condition only. Often, the repair was performed using completely different materials and techniques, which was more like the forced minimum actions to keep the object safe than restoration work.

During this period, creating art galleries in buildings specially built for them or well suited for their artistic and architectural merits was a practice. The Medici family, for example, spent most of their treasury on creating galleries. In 1582, the building, built by John Vasari in 1565 for administrative offices, was assigned to the now-famous Uffizi Gallery (*Fossi, 2013*). The Uffizi building is connected with another famous Pitti gallery by Ponte Vecchio. Similar gallery complexes appeared in other cities of the Apennine Peninsula – Pisa, Siena, Verona and Venice – and in major European cities later – in Germany, France, Spain, the Netherlands, Sweden and England.

Therefore, all these galleries were created to preserve already available cultural heritage objects – painting and sculpture. It could be considered the basis for the announcement from the end of the 16th to the beginning of the 17th centuries by the beginning of large-scale activities on preserving some types of cultural heritage objects: picturesque pictures, frescoes, sculptures and many objects of decorative and applied art, i.e., the forerunner of formation of klironomical outlook. This type of preservation was not yet meaningful in conservation because objects and items did not require expert intervention due to their relative temporary novelty and good condition. Until now, the civilisation has not kept any documentary evidence of the restoration of paintings or sculptures damaged during the exposure in the galleries during the 16th and 17th centuries. Perhaps those works were performed, but either secretly or so sporadically, and without a proper professional approach, they were not awarded the attention of the keepers of those galleries in their reports.

The Enlightenment replaced the Renaissance through religious reformation. A new epoch was determined in the late 17th and early 18th centuries. However, the period of religious reformation became a turning point and significant in the true preservation of the cultural heritage of the European past. As mentioned above, the first documented restoration work of the Renaissance was performed with the frescoes of the Sistine Chapel in 1565, at the end of the Renaissance.

The frescoes of the Sistine Chapel in Vatican (Italy)

160 years later, in 1726, during the Enlightenment, the artist Michelangelo Bellotti first attempted to restore the picture "Last Supper" of the outstanding painter and scientist Leonardo da Vinci. Already in 1729, the restoration work of Domenico Michelini in Venice with paintings by Titian was described (*Crowley, 2011*). Then restoration began to be defined as a professional direction, and the profession of "restorer" became more significant. In the second third of the 18th century, it became a profession in France, which could be considered a significant historical fact in forming a klironomical outlook. Almost 85 years, from 1735 to 1820, the Spanish Royal Gallery's paintings were restored after the fire of 1734 (*Iglesias, 1991*). Hundreds of valuable paintings had already been processed according to a special developed technique in a specially built Studio. Zahira Veliz was able to document the materials (*Sitwell & Staniforth, 1998*) used in the work, which helped to differentiate the history of developing the klironomical direction, i.e., the cultural heritage preservation at that time in three stages:

(1) ancient, or the era of ancient civilisations, ended with Antiquity, which performed irregular episodic restoration works of cultural heritage objects (palaces, temples, fortresses) without a conscious perception of the heritage of the past;
(2) barbaric, or the era of the Middle Ages and the Renaissance when the destruction and appropriation of the cultural heritage of the past prevailed over their neglect;
(3) new, or the period of religious reformation and the Enlightenment when there was awareness of the preservation of existing objects and heritage of the past

for posterity to position them and began scientific understanding of conservation and restoration methods of preservation.

The intensive development of sciences – physics and chemistry, which contribute to understanding the scientific approach to conservation and restoration works, begins in the third period of the history of the cultural heritage preservation of objects and subjects. Among the most significant and documented activities in restoration and conservation of the 18th century, in addition to the above, we can distinguish the following:

- 1743-1780 – the first restoration works in Russia were performed in the Hermitage by Lucas Conrad Pfandzelt, i.e., technical restoration of oil painting (*Aleshin, 1989*);
- 1750-1815 – the work of Mauro Natal and Domenico Pullo on the restoration of paintings at the Central Museum of Art in Paris (*Noémie Etienne, 2013*);
- 1774 – Matias Asterreich published a catalogue of paintings from the collection of the Prussian crown (*Sitwell & Staniforth, 1998*), which Denon further used with the sample items, which were subject to restoration (*Sitwell & Staniforth, 1998*);
- 1777 and 1785 – Pietro Edwards, director of the restoration of public paintings of Venice and Rialto, published the basic concepts of preventive conservation, typical mistakes in the selection of materials, like the basis of respect for authorship and reversibility (*Edwards, 1994*; *Instituzione di una formale pubblica scuola, n.d.*);
- 1794 – American painter Charles Willson Peale described using wax to impregnate the canvas in his work (*Significant dates…, 2014*); this technique allowed the protection of many paintings in famous European galleries with wax by the middle of the 19th century.

Consequently, the 18th century became a fundamental stage in the formation of conservation and restoration activities for cultural heritage preservation, in other words, the formation of the worldview of society. We did not see the attention and care of man about objects and items of the distant past – the oldest civilisations and antiquity – in that time. However, archival documents indicated the beginning of the process of caring for the safety of objects and items of the relatively recent past – the last 200-300 years, i.e., the Renaissance. Still, based on the ideals of ancient art, neither its creators nor experts in the emerging field of preservation of art objects nor their customers from the category of wealthy representatives of society did not focus on the restoration of earlier objects and items of art.

The Enlightenment was marked by the release of understanding and the preservation of the cultural heritage of the past to a new level – scientific and educational klironomy. This gives reason to highlight the fourth stage in its history and development. This stage can be determined as the period from the beginning

of the 19th to the beginning of the 20th century. These 110-120 years are worth dividing into two vectors of development works to preserve the legacy of the past:

(1) cognitive vector is large-scale research works in southern Europe and North Africa;
(2) research vector is a large amount of research in the field of physics and chemistry of materials that contribute to the discovery of new effective methods of conservation and restoration of cultural heritage objects.

Among the research projects of the 19th century in archaeology, it is necessary to allocate:

- The works of British and French scientists who opened the magnificent palaces of the late Assyrian Kingdom with unique bas-reliefs depicting scenes of hunting, fighting, and religious action;
- Decoding of Rosetta stone by French Egyptologist Jean François Champollion (*Parkinson et al., 1999*);
- Discovery of the Royal Library of Ashurbanipal, one of the oldest in the world, in the city of Nineveh in the mid-19th century (*Grayson, 1980*; *Russell, 1991*);
- In 1861, the French traveller Anri Muo opened the Angkor Wat Temple, a grand monument to the Buddhist art of Cambodia (1113-1150), part of the complex Hindu and Buddhist temples of the 9th-13th centuries known under the common name of Angkor (*Albanese, 2006*);

The fragment of Angkor Wat (Cambodia)

- The discovery of the German self-taught archaeologist Heinrich Schliemann of the legendary City of Troy in the 1870s (*Traill, 1995*);
- In 1874-1876, in the course of excavations, Heinrich Schliemann found a shaft tomb from the Mycenaean Kingdom (*Hogarth & Schliemann, 1910-1911*);
- The research on Easter Island and the discovery of rongorongo writing (*Wieczorek et al., 2021*; *Ramirez-Aliaga, 2018*);

- The research of Russian scientists in Western Siberia at the end of the 19th century and the discovery of the world's oldest wooden sculpture of the age of about 11 thousand years – Shigir Idol (*Savchenko, 2004*);
- The research of British Egyptologist Howard Carter in the Valley of the Kings in 1914-1922 (*James, 2012*; *Carnarvon, 2007*).

Consequently, prospecting works of the 19th century were performed in leading European countries on a large area covering Western and Central Eurasia.

Research activities in restoration and conservation in the 19th century also began to be performed rapidly. As an example, we can bring many historical facts in chronological order:

- 1802 – a group of chemists and restorers led by Haken and Roser restored Raphael's painting "Madonna of Foligno" (*Merlini & Storti, 2013*);
- 1809 – count Chaptal de Chantelou published a treatise on the pigments used in Pompeii, Ancient Rome (*Gough, 1998*);
- 1812 – Antwerp pharmacist F. Berber used wax-rosin composition in his restoration practice to fix deformations (*Sfumato…, 2023*);
- 1813-1836 – restoration of the Kremlin complex after the liberation of Moscow from Napoleon's troops (*Bokarev, 2012*);
- 1851 – work on protection of Rembrandt's canvas "Night Watch" with wax;
- 1852 – John Segier restored nine large canvases in the National Gallery of London by the author's method;
- 1850-1853 – Michael Faraday held analysis for the National Gallery of London to examine the impact of fog, smog, gases and lighting to change the colour of the coating surface, like the study of varnishes and cleaning methods (*Hamilton, 2002*);
- 1863 – German researcher Max Pettenkofer patented the method of "reverse the ageing of varnish" as a result of exposure to vapours of ethanol (This method later led to an increase of the interactive areas between the canvas and the varnish, which complicated future cleaning procedures.);
- 1868 – the discovery of the cave of Altamira (Spain) with polychrome stone paintings of the Upper Paleolithic (Solutrean culture) (*Madariaga de la Campa, 2000*);
- 1870s – Louis Pasteur conducts a large complex of studies of paint and optical crystallography (*Debre & Forster, 1998*);
- 1896 – Wilhelm Conrad Röntgen first irradiates x-rays of the canvas (*Glasser, 1993*).

Archeological works in the cave of Altamira (Spain)

Also during the 19th century, the specialised laboratories that are actively working in the conservation and restoration of cultural heritage objects opened:

- 1815 – Sir Humphrey Davy created a portable chemical laboratory in which he examined pigments together with Michael Faraday (*Fullmer, 1969*);
- 1850 – the first stationary chemical laboratory for preserving cultural heritage objects in New York, the USA, was created (*Fullmer, 1969*);
- 1888 – Friedrich Wilhelm Rathgen became the head of the first chemical laboratory of the Royal Museums of Berlin, now the State Museums of Germany.

For example, the period from the 17th to the 19th centuries was also marked by many significant measures to account for and preserve significant objects in the Russian Empire. At the end of the 17th century, the measurements and the drawings of the ancient Buddhist temples in Siberia were made according to the order of Peter the Great. Catherine the Second issued decrees on measuring, researching, and accounting for buildings of historical and artistic value, such as preparing plans and descriptions of ancient cities and preserving archaeological monuments. The leading figures of Russia made active attempts to account for and protect monuments of antiquity and nature in the 18th century. For example, archival data indicate that the residents of Moscow and nearby villages appealed to the St. Petersburg Berg Board with a complaint and demanded to take measures to protect them from the disasters that brought ironworks built in Moscow and around it in 1754. Gradually, the attention to protecting natural and cultural heritage was greatly enhanced. In the 19th century, private and general state regulations governing construction and other activities were taken. The Construction Charter, which prohibited demolition or renovation, led to the distortion of buildings that were built in the 18th century, was developed. Public and scientific organisations played significant roles in conserving cultural heritage: the Moscow Archaeological Society, the Russian Historical Society, the Society for the Protection and Preservation of Russian Monuments of Art and Antiquities, etc. Cultural heritage protection problems are discussed at those

organisations' conventions. Also, as part of their activities, they performed the following activities:

- engaged in the development of legislation to protect monuments;
- raised the issue of creating state structures to protect cultural values.

Therefore, during the 18th and 19th centuries, European society radically transformed its klironomical perception of cultural heritage, paying close attention to developing scientific approaches to conserving and restoring paintings and monuments. Also, financing of large-scale exploration of ancient civilisations' territories on the subject of finding and fixing objects and items of the cultural heritage of ancient civilisations and antiquity began.

The modern stage of klironomy development or the preservation of the cultural heritage of the past can have been roughly identified from 1918 when a conference dedicated to the opening of ancient paintings was held in the Russian State (*Troitskaya, 1926*). The first all-Russian restoration conference was held on March 19-22, 1921 (*Central State Archive of Moscow*). Society has moved from private research to a systematic and regular exchange of experience. After this conference, during 1923-1933, the fourth large-scale restoration of the Great Sphinx of Giza the valley, which was headed by one of the greatest Egyptologists of the first half of 20th-century French expert Emile Bares, was held (*The Great Sphinx of Giza…, 2021*). Since 1928, international congresses on modern architecture (CIAM) have been held:

- 1928 – the 1st Congress in the city of Serrate (Switzerland) and the foundation of CIAM;
- 1929 – the 2nd Congress in Frankfurt (Germany), where the issues of creating a minimum comfortable home were discussed;
- 1930 – the 3rd Congress in Brussels (Belgium), which raised the problem of rational land distribution;
- 1933 – the 4th Congress in Athens (Greece), where the analysis of 33 leading cities was done and the Charter of Urban Planning was developed;
- 1937 – the 5th Congress in Paris (France), the theme of which was to understand the home as a place of rest;
- 1947 – the 6th Congress in Bridgewater (England), where the main goals of CIAM were confirmed;
- 1949 – the 7th Congress in Bergamo (Italy), which discussed the practical application of the Athens Charter and the creation of a modular urban grid of the CIAM;
- 1951 – the 8th Congress, Addison (USA), which discussed the problems of the central areas of large towns and cities;
- 1953 – the 9th Congress in Aix-en-Provence (France), which discussed the results of the study of human habitation;
- 1956 – the 10th Congress in Dubrovnik (Yugoslavia), which also discussed the study of human habitation (*Mumford, 2000*; *Risselada & Heuvel, 2005*).

The first International Conference on the Study of Scientific Methods for the Study and Preservation of Art Works, in which numerous seminars were, standards of restoration practice, document management and preservation of objects and subjects of cultural heritage defined, was held in Rome on October 13-15, 1930. The famous Athenian Charter, which marked the beginning of the process of globalisation of the problem of preserving cultural heritage and marked the modern stage of development of the worldview of society, was declared by the experts on the protection of monuments and historical sites at the Congress in Athens (Greece) in 1931.

Since 1934, training of experts in preserving objects and items of cultural heritage begins in Europe:

- 1934 – opening of conservation courses in the Courtauld Institute of Art in London;
- 1936 – opening of conservation courses at the Academy of Fine Arts in Vienna;
- 1939 – opening of conservation courses at Doerner Institute, the state institute of technological testing and research in painting;
- 1949 – opening of conservation courses in the Institute of Technology Malerei in Stuttgart;
- 1952 – the first graduation of conservation specialists of the International Institute of Conservation;
- 1959 – the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) starts working in Rome;
- 1970 – the first graduation of conservation bachelor at the College of Copperstone (USA);
- 2005 – the University of Los Angeles introduced the discipline of Archaeological Restoration into the curriculum.

The Association of Professional Education for Conservation at Harvard University Club became the result of creating a network of educational institutions in Europe and the United States in 1984.

In parallel, intensive work on the development of scientific theoretical and practical base was performed:

- 1937 – Doerner Institute (*2019*) was established;
- 1939 – the Higher Institute of Conservation and Restoration, whose task is to develop codes and rules for the protection and preservation of objects and items of cultural heritage, was established in Rome (*La storia dell'Istituto, 2013*);
- 1948 – the Royal Institute for Cultural Heritage was established in Brussels, and a preliminary meeting of specialists was held to prepare for the establishment of the International Institute of Conservation (*About KIK-IRPA, 2009*);

- 1950 – the International Institute of Conservation, now known as the International Institute of Conservation of Museum Objects (*A Brief History of IIC, 2015*), was established;
- 1957 – the Central Roman Institute established the Laboratory of Applied Biology, which began to work in art objects preservation (*Cultural Properties, n.d.*);
- 1960 – the first regular meeting of the IIC-American Group, Isabella Stewart Gardner Museum, now known as the American Institute for Conservation, with more than 3300 members (*American Institute…, 2020*);
- 1960 – the first four students began graduate training in conservation at the Conservation Center, Institute of Fine Arts, New York University (*2021*);
- 1963 – Cesare Brandi published the "Theory of Restoration" (*2011*);
- 1968 – the Code of Ethics and Standards of Practical Conservation was published (The Murray Pease Report) (*1964*);
- 1976 – Research Center on the Materials of the Artist and Conservator (*2015*) at Carnegie Mellon University established;
- 1991 – the European Confederation of Conservatives and Restorers (ECCO) (*2002*). was established;
- 1999 – the International Network for the Conservation of Objects and Subjects of Contemporary Art (INCCA) (*2002*) was established.

During the 20th century, many significant scientific developments in the field of physics and chemistry of materials, which made a considerable contribution to the development of methods of conservation and restoration of the objects and items of cultural heritage, were made:

- 1931 – James Rorimer of the Metropolitan Museum first published Ultra-violet Rays and Their Use in the Examination of Works of Art (*1931*);
- 1932-1942 – publication of Technical Studies in the Field of Fine Arts for the Fogg Museum of Art, the first technical journal (*Kaplan, 1976*);
- 1939-1940 – the group of international experts in preserving cultural heritage published "Manual on the Protection of Paintings" (conservation) in French and English in France (*1940*);
- 1940 – experts in art history, restoration and chemistry published "Guide to the Preservation of Paintings";
- 1955 – vacuum pressure in the hot table was first used (*Hoare & Connell, 2020*);
- 1960 – Jack Willard created a table with a vacuum supercharger for the re-restoration of painting (*About Willard, 2010*);
- 1973 – Andrew Oddy, the main conservator at the British Museum, proposed a test to determine the safety of materials on art objects, now called the Oddy Test (*Oddy, 1973*).

In parallel, there has been an enormous number of search and research, conservation and restoration works, among which it is necessary to highlight the following around the world over the past 100 years:

- 1900-1930 – British archaeologist Arthur Evans discovered and excavated Minoan civilisation in Crete (*Evans, 1964*);
- 1911 – Hyrum Bingham, the American historian from Yale University, opened Machu Picchu in Peru, i.e., Inca fortress, the sanctuary of the 15th-17th centuries (*Bingham, 1989*);
- 1922 – British archaeologist Howard Carter discovered Tutankhamun's tomb (*Carter & Mace, 1923*; *Carter, 1923-1933*);
- 1923-1933 – the 4th restoration of the Pyramid of Cheops (Khufu);
- 1950s – the Dead Sea Scrolls were discovered (*Burrows, 1955*; *Davies, 1956*);
- 1951 – during excavations in the Novgorod layers of the 11th-15th centuries, the archaeological expedition of the USSR Academy of Sciences discovered birch bark-ancient texts, scratched or pressed on pieces of birch bark, a unique source on the history of the old Russian language, socio-economic and political relations, in Novgorod the Great (*Curta, 2019*; *Franklin, 1985*);
- 1955-1987 – the Department of Egyptian Antiquities of the National Museum of Antiquities in Cairo did the 5th stage of the restoration of the Pyramid of Cheops (Khufu);
- 1974-1984 – discovery and full-scale excavations of the "Terracotta Army", the burial of more than 8,100 full-size terracotta statues of Chinese soldiers and their horses at the Mausoleum of Emperor Qin Shi Huang in Xian (China) (*Rich, 2023*);
- 1977 – The expert in Greek archaeology, Manolis Andronix, discovered the burial place of Macedonian kings in Vergina (*Grant, 2020*);
- 1987 – the Galilean boat, an ancient fishing vessel of the 1st century, was discovered on the Northwestern shore of the Sea of Galilee in Israel (*The oldest ships…, 2020*).
- 1993 – Novosibirsk archaeologist Natalia Polosmak's expedition discovered Princess Ukok, the ancient mummy of a woman "Princess of Altai", in a Kurgan of the Scythian period in the Altai plateau Ukok near the border of Russia and Mongolia (*Lamin, 2003*);
- 1993-1999 – the 6th stage of the restoration of the Pyramid of Cheops (Khufu) on the results of an Interdisciplinary Symposium in Cairo in 1992;
- 1994 – the ancient settlement of Gobekli Tepe, which is about 9000 years old, was discovered (*Mann, 2011*; *Clare, 2020*);
- 2009 – the collection of gold, silver and metal objects from the collection of the Anglo-Saxon era of the 7th and 8th centuries was found in the village of Hammerwich in Litchfield (Staffordshire, UK) (*Jarman, 2021*; *Cool, 2015-2016*);

– 2015-2017 – the ScanPyramids project on the muon tomography scanning method (*About ScanPyramids, 2016*).

British archaeologist Arthur Evan,s discovered and excavated Minoan civilization in Crete, and his collegues

Consequently, a large number of research projects in archaeology and the organisation of numerous courses and departments for the conservation and restoration of objects of cultural heritage in the leading universities of the world have prompted researchers to develop a unified methodology for the study of this direction of art history and cultural sciences and to allocate klironomical areas – conservation and restoration – as a separate science.

In the last 100 years, active work in developing the direction of cultural heritage preservation has been performed in the Russian State, too. For example, the Museum Department of Restoration in the Central State Restoration Workshops "Glavnauka" (CSRW) held a series of expeditions to various areas of the country to find and describe the objects and items of national cultural heritage from 1918 to 1927. In 1918, the Department of Museum Affairs organised the all-Russian Restoration Commission, which was later transformed into the CSRW. In 1921, the Academic Center, which included the Main Committee for Museums and the Protection of Monuments of Art and Antiquity (Glavmuzey), was established under the People's Commissariat. In the same year, the first all-Russian restoration conference was organised in the Soviet state. The restoration workshop was established at the Russian Museum (St. Petersburg) in the next year. 1935, it was divided into laboratories and sectors: painting, new painting, sculpture, applied art and folk. The graphic restoration workshop was established in the same place in 1953. The following year, a workshop for the restoration of old Russian paintings, a workshop for the restoration of wooden sculptures, decorative carvings, and furniture, and a workshop for the restoration of fabrics were established in 1961.

Also during the 20th century, as in the 19th century, a vast complex of restoration projects related to the restoration of objects of cultural heritage after the First and Second World Wars and because of the priority significance to preserve the

cultural heritage of the country implemented in the Russian state. It is necessary to distinguish the following most significant restoration projects:

- 1919 – art restoration started in Novgorod the Great. A significant part of the frescoes in the Uspensky Cathedral (Vladimir City) on the Klyazma River, performed in 1408 with Danila Black, revealed;
- 1929 – architect I. Kuznetsov restored the painting of the dome in the Epiphany Cathedral in Yelokhov (Moscow);
- 1950 – the restoration of the painting of the Cathedral of the Nativity of the Theotokos (Rostov-on-Don City);
- 1950-1956 – the restoration of the interior of the Kazan Cathedral (St. Petersburg);
- 1953-1963 – the restoration of the Uspensky Cathedral (Rostov Town);
- 1962-1974 – the restoration of the Znamensky Cathedral (Novgorod the Great) under the leadership of G.M. Pillar;
- 1963-1968 – the restoration of the facades of the Kazan Cathedral (St. Petersburg);
- 1966-1968 – all-Union Scientific Restoration Workshops under the guidance of architect V.S. Banige performed restoration work in the Saint Sophia Cathedral (Vologda City);
- 1972-1994 – the restoration of the Church of the Savior on Spilled Blood (St. Petersburg);
- 1974-1981 – the restoration of the painting of 12th, 15th, 17th, 19th and 20th centuries in the Uspensky Cathedral of the 12th century (Vladimir City);
- 1974-1994 – the restoration of facades and interiors of the Peter and Paul Cathedral (Peterhof, suburb of St. Petersburg);
- 1989-1999 – the restoration of the Transfiguration Cathedral (Nizhny Novgorod);
- 1993-1995 – the restoration of the ancient iconostasis of the Uspensky Cathedral of the Ryazan Kremlin (Ryazan City);
- 1998-2000 – the full-scale restoration of the Trinity Cathedral (Ekaterinburg City), dome drums and bell tower newly built;
- 1998-2007 – the restoration of the Valday Iversky Monastery (Valdai Town);
- 2004 – the restoration of the Cathedral of the Exaltation of the Holy Cross of the St. George's (Yuriev) Monastery (near Novgorod the Great);

- 2004-2008 – the restoration of the Lutheran Cathedral of the Holy Apostles Peter and Paul (Moscow).

Cathedral of the Exaltation of the Holy Cross of the St. George's (Yuriev) Monastery (near Novgorod the Great)

Modern local wars have again put many valuable world, regional and national cultural heritage objects at risk of destruction and disappearance. The ongoing fighting in Syria has already led to the destruction of ancient cities, such as Palmyra. Restoring these cities is almost impossible due to the enormous percentage of damage. To date, we can talk about partial restoration with a large proportion of reconstruction. Consequently, Syrian cultural heritage sites have already been partially lost to humanity. Similar problems may occur in Ukraine. The Slavic War, which began in 2014 and entered an active phase in 2024, threatens to preserve cultural heritage in the historical centres of the country. Objects of the world and national cultural heritage in Odesa, Kharkiv, and Lviv come under shelling. Some field sites of ancient human sites and settlements are also under threat. If the Crimean cultural heritage sites have escaped the bombing, then the war in the continental part of Ukraine will continue. Restoration work on destroyed and damaged cultural heritage sites is not yet possible.

Thus, empirical studies of the preservation history of the cultural heritage of the past prove that the klironomical worldview began to form from the development of the first known civilisations of Mesopotamia and North Africa, which can be traced in numerous archaeological studies confirming the presence of restoration works in the Sumerian-Akkadian Kingdom and Ancient Egypt. In the last 150 years, society has radically changed its attitude toward the heritage of the past and begun to apply a scientific approach to preserving and restoring cultural heritage. The change of thinking, the transition from ignoring the material past to its delight, and then the realisation of the absence of eternity concerning matter conditions and the desire to preserve the beautiful – all of them led to the practical realisation of the desire through scientific research, creating a methodology and organisation of the educational process in order to graduate professional workers in restoration and conservation of cultural heritage objects. All of them are

actualising the creation of a new unified scientific direction of klironomy, i.e., cultural heritage preservation, at the beginning of the 21st century.