Т. В. ПОРТНОВА

Интеграция науки и искусства в изучении художественной культуры Ренессанса

Художественный материал Ренессансной эпохи и разработанные в исследовании методологические подходы, а также полученные результаты позволяют дополнить понимание специфики ренессансной культуры, в которой архитектура, живопись, скульптура, театр и наука соединяются в единую философско-антропологическую идею. В отдельных разделах статьи: «Вопросы научной перспективы», «Исследования пластической анатомии», «Появление новых конструктивных систем», «Изобретения новых изобразительных техник» показано, в каких аспектах и как именно воплощается научный подход, формирующий идеальный строй художнического мировоззрения. В эпоху Возрождения искусство воспринимается как одно из самых мощных средств познания и в этом качестве уравнивается с наукой. Вопросы интеграции науки и искусства в изучении художественной культуры Ренессанса не только искусствоведческих и культурологических, но и смежных специальностей для студентов вузов представляет особый интерес. Однако в системе современного изучения тем, посвященных данной эпохе, проблемам взаимодействия искусства и науки не всегда уделяется должное внимание. Они рассматриваются как попутная, а не специальная информация, во многом, помогающая понять особенности исканий эпохи, представить субстанцию ренессансного мышления. Синергетический подход, позволил иначе взглянуть на соотношение научного и художественного творчества деятелей Возрождения и выявить их общие и особенные черты. Все проанализированные факторы позволяют утверждать, что именно синергизм науки и искусства эпохи Возрождения породил особый аналитический вид творчества, требующий соответствующих образных сцеплений.

Ключевые слова: ренессанс, наука и искусство, интеграция, методология изучения, синергетический подход, искусствометрия

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Integration of science and art in the study of Renaissance art culture

The artistic material of the Renaissance era and the methodological approaches developed in the research, as well as the results obtained, allow us to supplement the understanding of the Renaissance culture specifics, uniting architecture, painting, sculpture, theater and science into a single philosophical and anthropological idea. The separate sections of the article ("Matters of scientific perspective", "Studies of plastic anatomy", "Emergence of new constructive systems", "Inventions of new fine arts techniques") cover the aspects and exact embodiment of the scientific approach as it forms an ideal system of an artist's mindset. The Renaissance era perceives art as one of the most powerful means of cognition and as such is equated with science. The matters of integration of science and art in the study of Renaissance artistic culture are of particular interest to students of higher education institutions, not only of art history and culture majors but in related fields as well. However, the problems of interaction between art and science are not always given due attention in the modern system of study of topics dedicated to this era. They are regarded as incidental, not special information, in many ways, one helping to understand the peculiarities of the creative quest of the era, to embody the substance of Renaissance thought. The synergetic approach presented an opportunity for a different look at the ratio of scientific and artistic creativity of Renaissance figures, revealing their common and special features. All the analyzed factors allow us to assert that it was the synergy of science and art of the Renaissance era that gave rise to a special analytical type of creativity, requiring the appropriate metaphoric links.

Key words: Renaissance, science and art, integration, research methodology, synergetic approach, artometry

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Introduction

The study of the Renaissance era is associated with the time of great geographical discoveries, the successful study of the globe by European civilization, the development of new parts of the world, continents, countries, peoples, and cultures, as well as the creativity of great masters and their outstanding works. It is marked by the emergence of a constellation of artist scientists, with Leonardo da Vinci taking the most prominent place. The rapid development of sciences such as mathematics, astronomy, and mechanics contributed to the formation of an experimental method based on the combination of science and artistic practice. The discoveries and inventions of this period made a huge impact on the subsequent history of humankind and on the history of art. It is important to note that the Renaissance is a special period of European history. On the one hand, it is the golden age of art, the revival of ancient principles and humanist ideals. On the other hand, however, the former values and attitudes are being destroyed. A new concept of the human being is being formed: a determined and enterprising person. This kind of freedom has an anthropocentric dimension because it is in this horizon of consciousness that it can be justified and its claims to its own fundamental importance can be rationalized. Within the framework of this freedom, the necessary and sufficient conditions are created, allowing the manifestation of enterprise, ingenuity, human activity, education, cognition of the world and oneself in this world. The Renaissance art is peculiar in its pronounced democratic and realistic character; it is centered on man and nature, reason and nature are considered to be similar, while science and art are considered as two completely equal ways of studying nature. It is absolutely fair to apply the concept of artometry to the analysis of Renaissance creativity, reflecting mathematical alignment, proportionality, and harmony in the structure of works of art. Artists achieve a truly wide scope of reality; they are able to properly reflect the main trends of their time. They seek the most effective means and techniques for presenting the wealth and diversity of forms available in the real world. "Those who fall in love with practice without science - as Leonardo da Vinci claimed - are like captains going to the sea without a steering wheel or compass. Never can they be sure where exactly they are heading. Any practice should always be based on good theory; nothing in painting can be done well without it" [14]. Beauty, harmony, and elegance are considered as properties of the real world. It is the synergy of science and art that became the reason behind the extraordinary progress in the development of European culture [3]. This explains the emergence of truly titanic persons who embodied and personified the organic unity of science and art.

Methodology and sources of research

This study is aimed at identifying and analyzing the main methodological problems arising during the research of topics related to the role of science in the Renaissance art.

Geographical and chronological boundaries of our study are limited to Italy, the country of classical and demonstrative Renaissance.

The academic novelty of the study is in the analysis of the synergy between science and art in the Renaissance culture. Despite the Renaissance era still attracting the attention of various researchers such as historians, philosophers, art historians, and culturologists,

despite numerous papers written about the titans of the Renaissance, about art, and humanism, the matters of synergy between science and art as a special type of creativity in the Renaissance culture were never considered. The matter of the specifics of scientific knowledge and its essential differences from the art knowledge in the context of the works of masters of the Renaissance remains undeveloped.

The general purpose of the research is to reveal the distinctive metaphoric and scientific nature of Renaissance thought perceiving the creative process and artistic creation as the cognition of the world.

The following objectives are expected to be reached in the study:

- To determine the importance of science for the creative concept of Renaissance masters;
- To consider the forms of interaction between science and art in the field of artistic culture;
- To identify the generals and the specifics in the scientific and artistic creativity of the Renaissance figures;
- To substantiate the assertion that it was the synergy between science and art that gave rise to a special type of creativity during the Renaissance era.

It should be noted that in singling out the scientific aspects of the Renaissance art we perceived the artistic culture of the given period as a discrete rather than a continuous process of development from the Proto-Renaissance to the Late Renaissance; the reason for this is we do not see this methodology having any contradictions between different positions in the study of the stages of this cultural era as special but at the same time typical to a large extent.

Analysis of the literature allows us to group it according to the following substantive features. In the humanitarian sphere of scientific research, one can refer to sources revealing diverse aspects of art history, cultural, pedagogical problems of the Renaissance era – art history, cultural, pedagogical: Haughton, N. [13]. Manca J. [18]; Simons P. [23]; Steele B. [25]; Stork D. [26]; Pesic P. [19]. The bibliography dedicated to the study of the artistic heritage of Renaissance masters of various periods is quite extensive. Especially common are materials dedicated to the High Renaissance titans such as Leonardo da Vinci, Michelangelo, Raphael, etc. There is some general bibliography having a direct or indirect relation to our topic: Batkin L. [4], [5]; Gaidenko P.[9]; Garin E. [10]; Guardini R. [11]; Svarovskaya V. [24]; Ushakova N.[27] ; Jong J. [16] ; Makho O. [17]; Zhao E. [30]. Let us also note the works directly related to our study: Alpatov M. [2]; Chechetkina I. [7]; Butterfield H. [6]; Woolfson J. [29]; Schroeder J., Borgerson J. [21]. The following monographs can be mentioned: Zubov, V.P. [31], Grinnell G. [12], Richmond S. [20]. These serious fundamental works served as an important reference point in our study. However, they do not clearly identify or structure the scientific aspects that need to be addressed when studying the “Renaissance Art” course in higher education institutes. As we see it, these are important because they show the ways and determine the direction for student research papers being part of the educational process.

Results

Thus, it is necessary to note the following aspects related to scientific categories in the theory and practice of teaching the “Renaissance Art” course:

Cognition of nature and representationalism

The true innovation of the Renaissance era is the result of a profound mastery of the traditions of the realistic approach to drawing, painting, and sculpture. There is a dialectical interrelationship between tradition and innovation. Tradition gives rise to innovation, which means that the next stage is necessary. The symbolic description of the world was common in medieval Europe, meaning various things were related to each other, not by their optical but rather inner qualities. This was manifested in a variety of deviations from the realistic understanding of form (such as primitive composition, the flatness of the image, and poorly drawn figures), sometimes explained by national peculiarities of the artist's perception. "The earthly world of a medieval man had no clear spatial parameters. And not only because it was laid open before the spatial immeasurability of the sky; no, the medieval world was not measurable in any fixed measures because of its lack of stability. How can one measure the distance from one mountain to another, when they themselves can easily be moved from their places: not only by the word of God but even by the prayer of any mortal. Faith moves mountains, faith reveals the bottom of the sea, faith reverses the flow of rivers." [8]. Where in the art of the Middle Ages man existed in nature, and, together with the whole nature the entire earthly world, being opposed to the extraterrestrial, heavenly world, in the art of the Renaissance man exists in a closed, architectonically arranged world, which itself is an earthly, studied space, isolated from the immense and unshaped being that is subordinate to the "natural" nature. The professional, realistic approach of Renaissance masters presumes purposeful and versatile study and cognition of the laws of the world by means of images. Drawing and painting from nature is a professional school for them, because only through constant practice in painting from nature the eye sensitivity to the variety of color and tonal gradations can be developed, which allows the Renaissance artist to transform the color of the paint into an expressive tool for interpreting reality. In thinking the formula out, the Renaissance artists proceed from the very sum of images and impressions received by them through vital observations and practice of drawing from nature. The aesthetic sensitivity is born in communion with nature. The emotional experiences received from such a communion are a necessary condition for the creation of the imagery of a work. These experiences, together with the level of professional skill, determine the potential for artistic thinking and creative success. Such unity of research, artistic and emotional development of reality was necessary for the artistic creativity of the Renaissance masters.

Exploring the scientific perspective

In the Renaissance era, the objective image of the world was the one seen through the eyes of man, so the problem of space was one of the most important problems the artists encountered. By the 15th century, this problem was universally recognized, with the only difference that in the European north, particularly in the Netherlands, the objective composition of space was reached gradually, through empirical observations, while in Italy, the scientific theory of linear perspective based on geometry and optics was created already in the first half of the century. This theory made it possible to build a three-dimensional image on the plane that is oriented to the audience, taking its point of view into account, thus achieving victory over the medieval concept of the image. Artists began to see the world differently: the earlier flat, somewhat incorporeal images of medieval art gave way to new three-dimensional, vivid, and convex space. A certain evolution of the Renaissance artists' exploration of space can be identified. I.E. Danilova notes: "The Trecento artists have all

the objects, all the figures settled, compressed, squeezed in the lower, earthly zone, which becomes crowded and over-saturated. In the next, 14th century, this lower zone begins to expand, stretching into the depth, winning back a new earthly space from the plane: the space of the third dimension... The fifteenth century was fond of modeling. A model offered the possibility to try out a new structure, adapt it, master it, and, if necessary, make changes, because, unlike the divine craft, it is natural for a human creator to experiment, make mistakes, correct mistakes, and strive for perfection" [8].

Giotto di Bondone (1266/67-1337), one of the greatest artists of the Italian Proto-Renaissance, was the most radical reformer of painting. In the frescoes of the Arena Chapel in Padua, his masterpiece, he interprets the Gospel episodes as events in human life. By placing them in a real situation, refusing to combine asynchronous moments in one composition, he achieves spatiality, although the scene housing the action, is usually not deep. Giotto's architecture and landscape are subject to action. Every detail in the compositions directs the viewer's attention to the pivot. Giotto predetermined the way the Renaissance developed: its dynamics, dramatic narrative, its transition from flat images to volumetric, relief-like images. The new concept of painting is based on a linear perspective and volumetric interpretation of figures. Giotto laid down the scientific foundation for Renaissance art. Although he was not the only artist of his time to embark on the path of reform, his determination, resolve, and bold break with the essential principles of medieval tradition make him a visionary of the innovative art converging with the science.

In the Renaissance age, the art of theatrical scenery is put on a scientific basis as well. The scenery created by Pietro di Gottardo Gonzago (1751-1831) for opera and ballet performances in the theatres of Milan, Rome, Venice, Padua, Alexandria, Mantova, and Genoa has a truly illusionistic effect. He was striving to create an atmosphere of another space. That's why an artist director back then ultimately was an architect who can build a palace on the stage, create a grotto or a pavilion. П. Gonzaga wrote theoretical works as well ("Music for the eyes and theatrical optics", "On taste and beauty", and "Notes on the construction of the theater"). He created the "Theatre of Scenery", where the audience came to enjoy the beauty. Live music sounded there, while beautiful landscapes, palaces, squares, and ruins of ancient temples were changing on the stage. The multi-faceted relations arising in the space of the theater make it possible to multiply and deepen the world of artistic reproduction of life, and, thanks to the concentration and intensity of the events taking place there, to surpass the "real reality". [1]

The newest experience of perspective composition used by the Renaissance masters shows that true documentaryism coming from nature is not indifferent or contemplative, but engaged instead; it enhances the artistic saturation of the visual imagery. Devoid of depersonalized exactness, combining direct observation with a purposeful movement of artistic thought instead, it helps to analyze and generalize.

Art as a design culture

The genesis of design culture can be found "within the art of the Renaissance" [22]. Project-oriented thinking is typical for many universal masters of this historical period. Giotto, Masaccio, A. Mantegna, A. Durer, and others in their painting design an architectural space that does not exist in reality, but still possesses the authenticity of the original, "staging" visual perception, visualizing the central perspective and new spatial and compositional schemes, i.e. simultaneously perform artistic and basically design actions in painting. Among

these, the works of Leonardo da Vinci are considered to be the largest design phenomenon not only in invention and engineering but in fine arts as well. At the same time, Leonardo understands painting as a universal model of any activity. He experiments in designing the space: such is his “sfumato” technique invention; it imitates an aerial perspective, varies the point of view on the subject, reveals different variants of reality, and asserts the fundamental procedurality (hence the incompleteness) of the work, etc. Painting (picture, fresco) in the Renaissance era is considered to be either an accent or a continuation, development of real space, which, in turn, becomes an extension of the painting space. For example, Leonardo's Last Supper forms a single system in which fresco painting and the real interior of the monastery's refectory are combined semantically. At the same time, a certain spatial distance between painting and reality is preserved. The universalism of masters was determined by their conviction that all areas of human life are worthy of the artist's attention. Therefore, the form of a utilitarian thing should be as harmonious as a work of “pure” art. During this period, the craftworks (proto-design) are characterized by their compositional balance of elements achieved through strict symmetry and static form, which are revealed by both the structure of things and their decor.

Many successful magnificent projects were implemented in the Renaissance era under the leadership of Lorenzo Medici, a Florentine statesman, patron of art and science, as well as under the leadership of the Vatican popes. Among the specialists involved by them for the implementation of their plans, were such titans of the era as Michelangelo, Raphael, as well as other famous artists such as Pinturicchio, Perugino, and Ghirlandaio. An illustrative example is the Tomb of Lorenzo de' Medici by Michelangelo, ordered by Pope Clement VI. This project was implemented during the crisis of civil liberties, and it is clear when the political events changed the sculptor's work, but never stopped it. On the example of Michelangelo's Sistine Chapel and Raphael's Stanze in the Vatican papal palace, one can trace the logical dependencies in the projects when no subsequent work can begin without finishing the previous one. Their work on the ceiling paintings of the chapel can be called milestones of the project. According to Giorgio Vasari's memoirs, the order management processes included identifying the necessary corrective actions, their coordination and approval, but Michelangelo preferred to work without any restrictions and his customers had to adjust to the master.

As we can see, the method of creative activity developed in the Renaissance era, revealing the project-oriented architecture, painting, and sculpture, allows one to consider it as a reliable developing and teaching factor, which largely determines the design culture and practice of subsequent eras. High-tech projects tend to further develop the artistic and imaginative direction, while the art, being aware of the most important principles of its own development anew, becomes an essential part of the general process.

Studies of human anatomy

In their work, artists and sculptors of the Renaissance strived to achieve the naturalness, to a realistic reproduction of the world and man. Painting has been enriched not only by the linear and aerial perspective but also by the knowledge of anatomy and proportions of the human body; the problems of exact drawing and natural movement were worked on as well. A number of artists developed problems of movement and structure of a human body; therefore they have named analysts in science. These are Masaccio, Andrea de Castagno, and Domenico Veneziano. Leonardo da Vinci is the most prominent Renaissance man. In every field he studied, he systematically expanded and

deepened his knowledge, tested it on experience, and linked it to mathematics. Working in all fields of knowledge and art, everywhere he was both original and great; therefore, he can be called a precursor of infant science. Leonardo da Vinci's discoveries in the field of human and animal anatomy can be classified as research projects that served as a basis for creation of the anatomical atlas for artists; his engineering projects have become prototypes of future design inventions. Leonardo da Vinci himself was a participant in his own projects [14]. The numerous extant graphic drawings and handwritten descriptions of his scientific activity allow us to get acquainted with the introduction of anatomical research methods (observations made in the process of dissection, longitudinal and transversal cutting of organs and bones, comparative analysis, sketches in different angles and projections, and sequential description). They also help to reveal the planning methods for his own works on studying the human body structure as continuous processes, namely actions for the optimum achievement of set tasks considering the current situation (visiting hospitals, anatomical schools and theaters, etc.). At the same time, they convey the specifics of Leonardo's individual design concept developing the field of visual dynamical and plastic anatomy.

The emergence of new structural systems in architecture

It is in the Renaissance era that architectural form-making takes on a rational design character. Material objects originate in a project form; they are carried out in the material after this stage. Where the previous styles developed consistently, as if organically growing from each other, the Renaissance selected the artistic and cultural heritage of the distant past as the starting point for the development of its art. All sorts of innovations were observed in urban construction as well. The new architectural ideas were based on ancient models redefined and improved by modern architects. The most significant work of Filippo Brunelleschi was the erection of the dome over the finished structure of the Florence Cathedral. The task was extremely difficult, as the required dome had to have huge dimensions: about 50m in diameter. Brunelleschi solved the problem using his own original design. The size of the dome is comparable to that of the Pantheon. It has a faceted shape and consists of two shells. The outer one is made of red-brown tile and the inner one is a brick frame, which is a structural load-bearing element. Thanks to this solution, not only the dome itself turned out to be surprisingly light as if soaring over the city, but the entire cathedral building became harmonious and majestic.

The Renaissance era is characterized by the construction of secular central-dome buildings such as houses, palaces (palazzos), and new types of public buildings: town halls, hospitals, and theatres in addition to cult buildings. Country houses are being constructed again, with their design based on Roman villas. The tension of Gothic polygonal lines gave way to simple, mostly rectangular forms. One of the main points in the Renaissance architecture was the rejection of the Gothic stone frame structure in favor of a new simple, economical, and quite flexible construction system that facilitated the architect's work in many ways. The monumental interiors of the palaces were rich in their decoration. However, they were not copies or imitations of Roman interiors: the architects of the Renaissance could only have an idea of the interiors of Roman houses from Vitruvius' descriptions. The best interiors of the palaces of this era had proportional perfection, with all elements being in a modular interrelationship.

The Renaissance architects are the perfect example of masters who know how to make a functional standard serve the emotional side of architecture.

Inventions of new artistic technologies

New technologies were used in the Renaissance architecture in addition to traditional building materials. Brick structures were covered with plaster or stone (including marble) cladding. This cladding covered the main structure as the outer layer, sometimes acquiring an independent decorative and plastic role. Traditional stone is mainly used in the early period, in the form of stone blocks processed in various ways. It is used both in structures and in design elements.

Building mortars are becoming an increasingly important material. They are used not only in masonry, but also as smooth plaster, graffito, rustication, and in the creation of some architectural elements as well.

Renaissance architecture is characterized by the alternation of materials and colors; colored materials such as terracotta, majolica, and glazed bricks were widely used. These materials can be easily shaped to create different elements and details of architectural design.

The technical innovations apply to sculpture and painting as well. The Florentine sculptor Donatello is one of the most brilliant masters of the Early Renaissance, working in various genres, displaying true innovation in each of them. In his work, he used the ancient heritage, relying on a deep study of nature, boldly renewing the means of artistic expression; he participated in the development of the theory of linear perspective, revived the sculptural portrait and image of a naked figure, and cast the first bronze monument.

According to the *Lives of the Most Excellent Painters, Sculptors, and Architects* (1550) by Giorgio Vasari (1511-1574), oil painting was invented by Jan van Eyck (1390-1441), later became recognized as a pan-European technique, it was this technique that expanded the paintings and gave the opportunity to convey the space of a painting. [28] In addition, oil painting gave more opportunities for creative experiments, embodying the ideas on the canvas. It could be used not only in the studio but also outdoors (plein air painting). Recent discoveries of the French restorers revealed the microscopicality of the strokes on the paintings of Leonardo da Vinci; the thickness of the glaze layer there was just a couple microns. It is known that the artist himself invented additives to varnishes, paints, and oils; he strived to alternate paint layers, thus achieving a magnificent effect of different refraction of the light rays falling on the picture. Following him, Giorgione started his search for the mystery of painting in the lighting and its transitions, and in the play of light and shadow, acting as a precursor to Caravaggio and the whole Caravaggisti movement.

The variety and abundance of works available in museum collections offers a wide range of opportunities for the identification and research of entire groups of works of art where technique holds the absolute value.

Discussions

Our study allows us to assume that the chosen direction has a great prospect for its further development of art history topics following the Renaissance. The dialogical nature of art and science enhances the institutional capacities of these two areas. The scientific aspects reflected in the artistic culture of the Renaissance in the system of modern humanitarian art criticism speak of a special university educational potential. The modern concept of specialized education, the expansion of the information field, the emergence of different interpretations and often opposing assessments of the past led to a transition

from the transfer of knowledge to the development of creative abilities of each student, the disclosure of their capabilities, the training of highly qualified specialists capable of professional growth and professional mobility in the context of informatization of society and the development of new high technology.

Art itself can be considered as one of the types of cognition, its study contributes to the development of its creative abilities, skills of research and design activities in the field of art, but also to professional self-determination. Currently, there are various approaches to the presentation of lecture scientific material in the study of the artistic culture of the Renaissance, but most often, in practice, it is only an addition to the general picture of historical development. However, without it, it is impossible to create in students a full-fledged image of the era of that time.

The most productive approach to the study of science in the context of the Renaissance era, in our opinion, is an integrated approach based on a synthetic consideration of all areas of their interaction and functioning and overcoming an isolated consideration of art history material. The implementation of this approach can be carried out by introducing material on scientific achievements into the structure of topics studied, both general and dedicated to individual architects, sculptors, painters.

Another possible way to study a number of phenomena of a creative and scientific plan is to consider them through cultural and historical facts and achievements included in the general context of the era. Moreover, any specialized department requires students, especially at the master's level, special scientific research, and at the undergraduate level, the study of scientific issues in the Renaissance art is perceived as a semantic core around which new semantic structures appear.

Finally, another art history methodology for studying scientific achievements in Renaissance art may be the analysis of a separate monument of a given era, which involves working with scientific literature, literature, professional publications on relevant theoretical, practical, methodological issues, familiarity with rich iconographic material. This forms the ability to analyze, systematize and use scientific information in scientific and educational literature as part of ongoing research.

Conclusions

We have only mentioned a few of the scientific discoveries from the Renaissance period, but there are actually more of them. Having singled out the directions of scientific research in architecture, sculpture, and painting in separate sections, we tried to show how the working conditions and creative method of artists changed. The points made in the article may be organized as follows:

1. Science in Renaissance art: a type of artistic thinking, and a new way of perception of the world.
2. The integration of science and art: a phenomenon that lies on the border between seemingly different but actually related fields of the creator's activity.
3. Scientifically conceivable art is a new word in Renaissance art culture. It is associated with the changed consciousness of the era and therefore represents a new way of mastering reality, the basis for the construction of a special model of the world.
4. The synergy between art and science contributed to the formation of several variations of their interaction. It was reflected in the creative practice of architects, sculptors, and painters, and can be defined as artometry, which helps to cognize the unusual mathematical harmony of Renaissance works.

This topic was chosen intentionally because the objective of modern university education is to form the ability to act and be successful in the conditions of dynamically developing modern society. Therefore, the goal of teaching the “Renaissance Art” historical course, especially in art history majors, is to provide knowledge not only in the field of theory, history, and the methodology of creation of works themselves, as well as methods of studying this period in the history of art, corresponding to the current level of development of art studies and cultural potential of the era, which gives the greatest achievements in this field. It is important to determine the significance of scientific ideas and to study their specific manifestations in the artistic imagery of the works by various masters. The diversity of the museum collections, including Renaissance works, is an inexhaustible source for scientific research. It clearly shows how complex, unlike each other, can be the ways the human culture developed. The huge chronological range of the world's collections allows us to compare works created by different masters. It helps us to feel the movement of history and realize ourselves in its flow, leading us to an understanding of today's culture and art.

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