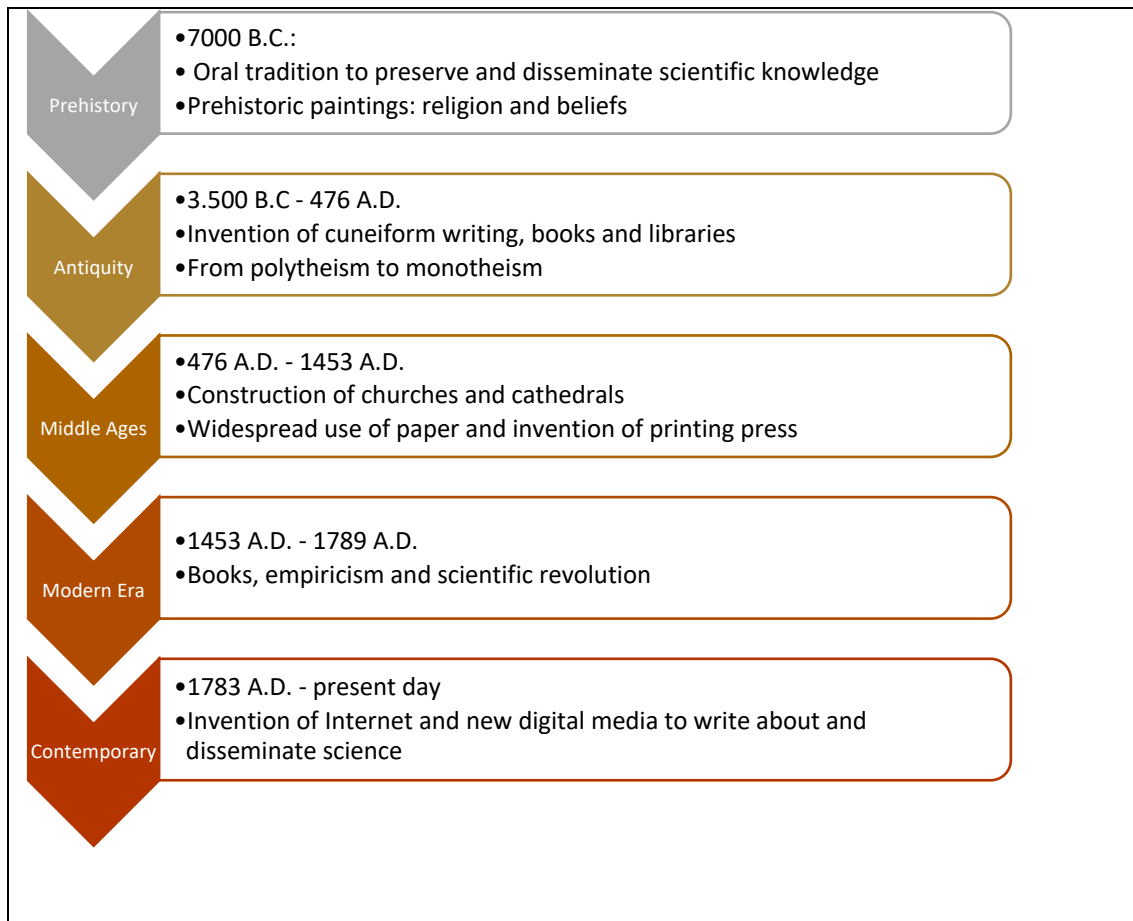


PROPOSAL INFORMATION SHEET ON TOPIC

Topic: Science and culture as representation in Europe
Description: <p>This unit examines the concept of science and forms of representation and knowledge transmission throughout history, along with the main changes and continuities in this regard. At different times throughout history, scientific progress has come into conflict with religious development, an aspect which is also reflected upon in this unit, particularly with regard to the importance of empiricism and rationalism.</p> <p>Likewise, artistic representations have also been an important social construct, particularly in relation to religious art and devotional images. Therefore, this unit looks into different religious representations in Europe and how they have understood the world.</p> <p>In addition, oral tradition and written language have long been the greatest forms of scientific representation. A reflection is made on the importance of these historical sources in order to learn and disseminate the scientific knowledge discovered by humanity.</p> <p>Finally, the construction of historical narratives as a scientific discipline is considered, from academic history, based on facts and events, to modern historiography and social history as a fundamental element for the understanding of society.</p>
Concepts <ul style="list-style-type: none">- Science- Rationalism- Empiricism- Scientific method- Arts- Temples- Oral sources- Writing- Press- Books- Historical narratives- Power
Chronological Axis



Sub-theme 1 **Science versus religion in Europe: rationalism and empiricism in the explanation of the world**

Humankind's varied responses and adaptations to their environment has given rise to the establishment and evolution of different types of knowledge, one of which is religious knowledge. Religion is a primitive type of knowledge, related to mythology and magic and characterised, among other elements, by the reverential fear of the holy. This leads to an attitude of submission amongst believers and the recognition that the priest who officiates religious ceremonies has a certain kind of magical power. One theory which attempts to explain religious knowledge states that it originates from the awe caused in humans by the mysterious, terrifying or marvellous, which stirs up adoration of hidden forces and mysterious beings. Another theory defends the idea that the genesis of religions can be found in their capacity to explain the exceptions which arise in the natural order of things, subsequently leading to the appearance of their miraculous or supernatural component.

Kant stated that religious knowledge seeks to control what is, by nature, unexplainable or unknowable. It is knowledge of what is undiscovered and impenetrable; a recognition that some things just cannot be known. This is what explains the "mystical" element and "irrational behaviours" of a type of knowledge which is pre-scientific and is connected to the experiences of huntsmen over the course of millennia.

Approximately 3000 years ago, the development and mastery of technology, geometry and astronomy led to the appearance of a new type knowledge which was selective, systematic and organised in accordance with the criteria of rationality,

when, in the 7th century B.C., the Greeks laid the foundations of a civilisation which still exists today. Thus, critical knowledge (i.e., the sciences and philosophy) came to question the mythical-religious explanations of the previous historical age.

The ancient Greeks made a distinction between *doxa* (opinion) and *episteme* (scientific knowledge), which included both science (*dianoia*) and philosophy (*noesis*), activities which went hand in hand until the 17th century, when they began to be more strongly differentiated, gradually growing apart until their total separation in the 20th century. This gave rise, as stated by Ortega y Gasset, to such a degree of specialisation that it became possible to speak of the appearance of the learned ignoramus.

In the present day, according to Mario Bunge, scientific knowledge is characterised by rationality and objectivity. By rationality, it is meant that:

- 1) Knowledge is made up of concepts, judgements and reasoning and not of feelings, images, behavioural guidelines, etc.
- 2) These ideas can be combined in accordance with a certain set of logical rules with the purpose of producing new ideas.
- 3) These ideas are not stacked up chaotically or simply in chronological order. Rather, they are organised into systems of ideas, into ordered sets of propositions (theories).

By objective, it is meant that:

- 1) It agrees approximately with its object; it seeks to attain a factual truth.
- 2) It verifies the adaptation of ideas to facts, resorting to a peculiar exchange with facts (observation and experimentation). This exchange can be controlled and, to a certain extent, reproduced.

In the world of Ancient History, the impact of this new type of knowledge was such that it implied that religions should be structured into theologies, which were mixed with science and philosophy for centuries. Indeed, many of the early philosophers were also scientists (biologists, mathematicians, etc.).

However, in the final stage of the Roman Empire, the assimilation of the new Christian religion, in combination with the weak role played by philosophy in Roman culture (with the exception of stoicism), led to the subordination of scientific-philosophical knowledge to religion when it came to explaining the nature of the universe, with rational explanations being sought to justify belief in God.

This climate lasted for generations until, around the 7th century, the ideas and innovations of the Muslim world enabled the literate inhabitants of Europe to rediscover Greek mathematics and philosophy. Indeed, the influence of Islam not only implied the rediscovery of the work of Aristotle, but it also revitalised scientific and technological knowledge based on progress made in fields such as physics, medicine and astronomy. The Jews also offered their mastery of knowledge and made scientific and cultural contributions in such a way that the Medieval Age in Europe was characterised by the continued existence of achievements of the past and a renewal and redesign of those ideas.

With the passing of time, in the 16th century, educated people began to seek answers to their problems in reason rather than faith.

In this context, in the 17th century, Francis Bacon advocated the separation of science and religion in order for the acquisition of knowledge to become easier and quicker, making it possible to improve people's quality of life via the transformative capacity

of science. Moving beyond the excessive veneration of classical authors such as Plato and Aristotle (among others), Bacon believed that, through scientific process, it was possible to formulate more general rules. Along these lines, he proposed a scientific method based on observation and experimentation. As an advocate of the idea that the human mind does not understand reality well due to the fact that it is corrupted by prejudices originating from our social, religious or ideological position, his doctrine regarding idols was a milestone in the history of the expansion of a scientific attitude in the field of humanistic and social studies. Bacon's theory of idols reveals that beliefs can be, or tend to be, merely prejudices, opening up the way to relate what is true and what is false with the nature of society and its beliefs, which condition the convictions, opinions and behaviour of human beings. The idols he mentioned are: the "idols of the tribe", relating to the tendency of human beings as a species to generalise; the "idols of the cave", or people's tendency to impose their preconceived ideas about nature rather than to observe what is really there; the "idols of the marketplace", i.e., the tendency to allow social conventions to distort experience; and the "idols of the theatre", relating to the influence of prevailing philosophical and scientific doctrines. A good scientist should fight all of these idols in order to attain knowledge of the world.

In contrast, the method applied by Descartes, by aiming to be free from any prejudice which could cloud understanding when making progress, aims to put an end to all dogmatism imposed from outside and lends reason a new level of dignity. From that time on, social scientists appealed to reason when claiming the certainty of their statements. In effect, the "method of doubt" introduced by Descartes sought to find a method to make progress towards the reliable knowledge of reality, constituting a starting point on the road to research.

Two opposing schools of thought arose based on the theories of Descartes and Bacon as far as the way in which human beings acquire knowledge is concerned. On the one hand, rationalism emerged from the thesis of Descartes, claiming that human knowledge only originates from reason. This inspired thinkers such as Spinoza and Leibniz and was the predominant school of thought in continental Europe. On the other hand, out of Bacon's ideas arose empiricism, a doctrine according to which our knowledge of the world comes from the senses and experience. This position was dominant in British philosophy among figures such as Locke, Hume and Berkeley.

It was not until the end of the 18th century that Kant, in his *Critique of Pure Reason*, conjured up rationalism and empiricism by sustaining that what we call "knowledge" is a combination of what reality contributes with the forms of our sensibility and the categories of our understanding. We cannot grasp things in themselves but only how we discover them with our senses and from our intelligence which orders the information brought by the senses. In other words, human beings cannot know pure reality (noumena), but only how it is real for us (phenomena). Our knowledge is true, but only to the point allowed by our faculties.

The school of thought known as the Enlightenment in the 18th century implied an effort to scientifically interpret the human condition in all fields. This was reflected in an extension of the natural scientific method to the study of human beings and their creations. It was in this way that the social sciences grew and became consolidated in the 19th century, a development of scientific knowledge which was not unrelated to the discipline of history. History is responsible for the rational, rigorous and

demonstrative knowledge of human processes which took place in the past. To achieve this, the “truth” is sought via the comparison of witnesses and by employing the critical-rationalistic principle of causality. Therefore, in order to offer a true and demonstrable knowledge of human past, history has at its disposal the following principles: the use of empirically verifiable evidence; the rejection of supernatural intervention in historical events; the seeking of rational causes for events; and a respect for the directional and accumulative nature of time, which does not move backwards.

Sub-theme 2. **Artistic representations and manifestations in Europe over time**

Religion and art have been connected from the very origins of visual representations. Indeed, Dupré and Holguín stated that “el arte constituye una parte esencial de la integración simbólica en toda la etapa primigenia de los desarrollos culturales”. These cultural developments are, fundamentally, social representations of a magical, sacred or religious nature. In fact, throughout Prehistory the vast majority of activities were related with religious rituals: births, deaths, illnesses, atmospheric phenomena, agriculture, cattle rearing, fishing, travel, war and love were all closely related to religion and people’s beliefs.

Thus, aesthetics and religion are two fields which have been connected since the appearance of the very first hominid societies.

A good example can be found in the rock art spread all over Europe, which has features in common with that found in other areas of the planet. Ritual dances, hunting scenes, representations of animals or votive figures for fertility provide a good representation of this ancestral union between religion and art and constitute the first symbolic representations of human beings. According to Westheim, art, like mythology, is somewhat irrational as it always depends on the emotions it arouses in the observer.

However, from the very beginning, the religious sense of art has a dual role. According to Belting, on the one hand, cult images were created to be venerated or to pray for help, while, on the other hand, narrations or stories were designed via images, the objective of which was to help the viewer understand the course of a sacred or mythological story.

Thus, throughout the Neolithic period and Ancient History the first human settlements were built up around places of worship, which served not as such, but also formed the nerve centre of the community’s social and cultural life. This was the case in urban centres in the Near East such as Bestansur, Sheik-e Abad and Çatalhöyük, as well as in the first cities located in China and America.

Indeed, the city-states of Mesopotamia were built around religious temples known as *ziggurats*. The sharing of power between monarchies and priests defined social structure in ancient societies. This is what Lévêque refers to as despot-cities in which rulers identified themselves with religious power and the divinities.

The lack of certainty experienced by hunter-gatherers led them to consider natural forces which they could not control as sacred: fertility, death, hunting, harvest, the stars, the origin of life, the passing of time, sickness and fortune. Veneration for these

phenomena was maintained in the first sedentary urban societies, although their symbolic representations changed to become progressively more anthropomorphised.

For Bottéro, both ancient Mesopotamia and Egyptian culture laid the foundations for religion based on the emotions of fear, awe and subservience to a variety of completely anthropomorphic gods (polytheism). In such a way, for example, the prehistoric feminine figures referred to as “Venuses” represented female bodies with exaggerated sexual attributes as an offering to pray for fertility. Mesopotamian culture continued this tradition via the goddess Anat, who was depicted naked, with large breasts and a prominent vagina. A similar representation existed in Egypt with the goddess Hathor, whose connection with fertility was also related with sexual and violent connotations, as can also be observed in the Greek representations of Athena or Roman depictions of Minerva.

In this regard, sculptures of the Greek and Roman gods are particularly worthy of note. The main deities were anthropomorphic and followed human models in an approach to naturalism. What was sought was to represent Greek ideals of beauty, as well as the dynamism and movement of works of art from the Classical and Hellenistic periods. The same phenomenon can also be observed in Roman representations. The concept of volume is fundamental in order to be able to contribute different points of view to such works of art, thus the perspective of the faithful and their veneration of the representations were already being taken into account.

Miron’s Discobolus, Polykleitos’s Doryphoros, Phidias’s Statue of Athena Parthenos and Praxiteles’s Aphrodite of Knidos are fine examples of the importance of sacred representations in the Classical period.

Indeed, the end of Ancient History and the beginning of the Middle Ages implied a fundamental change in the way people’s religious beliefs were represented. While in Africa, Oceania, a large part of Asia and on the American continent, different cultures continued with the ancient tradition of polytheism, the first monotheistic religions (Judaism, Christianity and Islam), in which there was only one supreme god, arose around the Mediterranean Sea.

Throughout Ancient History, temples and holy places tended to play a representative and monumental role, from the imposing Mesopotamian *ziggurats* (truncated pyramids), Egyptian temples and their imposing pylons at the entrance to Greek and Roman temples with their pediments. However, in many cases, they were linked to the life and community of the priests and those responsible for maintaining the faith. This meant that the faithful and believers had their access to the temples restricted or denied, perhaps being allowed to enter only for particular rites, processions or festivities.

The expansion of the great monotheistic religions came up against the great number of pre-existing religious representations from the Mediterranean, through the Middle East to the lands of the peoples who ruled at different times in Persia. Thus, small minority religions opened up a path through the main Mediterranean civilisations. The representations of these religions combined and assimilated with those of the official religions of Greece and Rome, with the idea of making them more accessible and visible to the people.

Processes of religious syncretism always arose in a natural way as the basis of the beliefs and the worship of Mitra, Isis and Christ, who originally occupied marginal

spaces in Rome (catacombs, Mithraea and other secondary places), gradually gained followers. This was particularly the case with Christianity, a branch of Judaism which had arisen in Palestine. The practice of these religions, therefore, took place inside their temples, a common characteristic (as shall be seen below) of the three great monotheistic religions.

Christianity grew to become the majority religion of the Roman Empire from 313 A.D., when Constantine I passed the Edict of Milan and declared freedom of religion, thus putting an end to religious persecution.

Iconographic representations in Judaism are not common as it is an eminently iconoclastic religion. Iconoclasm, from the Greek "icono" (image) is the religious dogma which does not believe in the transcendental power of images. However, in the case of Judaism, there was no strict prohibition of images, as was maintained in a large number of antisemitic texts in the Middle Ages. In fact, in the ruins of the synagogue in Na'aran (in the ancient city of Judea) part of the paving of the place of worship is conserved, in which it is possible to observe a representation of the menorah (dated to around the 5th or 6th century A.D.) which has a clear Byzantine influence. The rest of the images are of geometric patterns with different figures and, in the centre of the composition, a representation of Helios (the sun) with the twelve signs of the Zodiac. To the sides, there are figurative representations of the four seasons.

As can be observed, Jewish iconoclasm has not always been as rigid as later Christian interpretations have made out. Even its minimalistic geometric shapes were the object of criticism in the 20th century for being closer to the historical vanguards than to the classical monumentalism preached by Nazism.

A similar phenomenon can be found in the Orthodox Church throughout the Middle Ages. Christianity continued to be the majority religion in the Eastern Roman Empire following the fall of Rome. Not without debate and controversy, the Eastern Church distanced itself more and more from Rome as the years passed. A large number of common elements are logically shared, but iconoclasm became one of the main points of friction. It must be noted that early Christian art and architecture had a great presence in Byzantine territories, although from the 5th century, the so-called "Byzantine Iconoclasm" took place, not so much against the use of images, but rather against the mystical veneration thereof.

The exaggerated worship of images led to criticism from Byzantine leaders, intellectuals and politicians in such a way that, during the reign of Leo III, the veneration of images began to be persecuted. This iconoclastic movement was not principally aimed at art in general, but only against religious images. In any case, there were great political and religious consequences as, in fact, the war on icons had the objective of reducing the economic and political power of the monks (the majority of whom watched over extremely venerated images and relics) in favour of the political power of the emperors.

The representations of primitive Christianity or Paleochristian art served as a link between late Roman art, from which certain elements were borrowed, and the art of the Middle Ages, which was loaded with symbolism. For this reason, Paleochristian art resorts to simple symbols which were easy for new believers to interpret. These symbols were normally stylised and simple in order to make them easy to understand. Furthermore, perspective and spatial depth were foregone, with concepts such as the

proportions of the human body and realism in faces being more flexible as what was important was to transmit, spread and disseminate the doctrines of the ever-growing new religion.

Prayer houses and underground worship gradually gave way to the Paleochristian basilica as the centre of worship. Temples were designed based on the old Roman basilicas (originally buildings for the dispensation of justice and seats of power) as their structure, consisting of naves and open spaces, facilitated the internal separation of worshippers and priests. The clearest example of this is the Aula Palatina, also known as the Basilica of Constantine in Trier (Germany). However, this type of structure became more popular and spread throughout the Eastern Empire, as can be observed, for example, in the case of the Hagia Sophia in Istanbul.

In Western Europe, the late Roman art of the Goths, Lombards, Carolingians and Ottonians gave way to the Romanesque style, which was clearly influenced by Roman art and architecture. The urban growth of the 10th and 11th centuries led to the design of some of the great Christian temples, whilst in rural areas monasteries played the role of social, economic and cultural centres.

The most notable elements of this style are its paintings, with frescos decorating the interior of churches, which were designed to evangelise and educate the faithful. Thus, the art was simple, with clear lines and polychrome colours. Perspective and volume were foregone and the frescos are notable for their rigidity, symmetry and lack of expressiveness. The backgrounds are uniform and figures are flat and seen from the front. Thus, the main objective of this type of religious art is to be clear when it comes to being able to recognise the characters and their messages. Good examples of this can be observed in the frescos of Christ Pantocrator in Sant Climent de Taüll and the Virgin in Santa María de Taüll.

This style spread throughout Europe thanks to religious routes, pilgrimages and travel between monasteries. However, in the same period, Viking art was present in the north of Europe. The Vikings displayed religious representations on everyday objects, with deities appearing on the bows of ships, sword handles, brooches and on small metal objects such as earrings, necklaces, armbands and bracelets. The Borre style can be distinguished due to its symmetry, as in the case of Danish brooches, while the Jelling style has more naturalistic shapes and opts for representations of plants and animals within the diversity of the gods of the Viking pantheon, which were closely connected to natural phenomena. Good examples of such art include the Mammen Axe and the Bamberg Casket.

Meanwhile, in the south of Europe, the Iberian Peninsula and south of the Iberian Peninsula, an extremely different kind of religious art can be found: Islamic art. Islam, one of the great monotheistic religions, originated in Arabia in the 6th century A.D. and spread rapidly throughout the north of Africa, reaching Europe in the 7th century. Like Judaism, Islam is prone to iconoclasm, although, as mentioned above in the case of Judaism, this is not as restrictive and rigid as is often thought. In fact, images are not prohibited and, in the origins of this religion, many representations of figures can be found, although, with the passing of time, these images disappeared as they were not for worship or veneration. Muslim temples, or mosques, were normally decorated with geometric shapes, plants or calligraphy of verses from the Koran. A particularly good example is provided by the mosque of Córdoba. Civil buildings and palaces were decorated along the same lines with the addition of the effect of light and water as

ornamental elements. The prime example of this artistic style is the Alhambra in Granada.

In the Late Middle Ages, the religious reform of Saint Bernard and the expansion around Europe of the Cistercians brought the new art forms of the Gothic style to newly built churches and cathedrals.

The main element of Gothic art was its architecture, manifested in the construction of huge urban cathedrals in the main cities of Europe. These temples reached upwards via a complex system of buttresses and flying buttresses which formed the frame to support the ceilings and ribbed vaults. Semi-circular arches decorated the doorways and side windows achieving a verticality and brightness which united the faithful with the divine inside the temples.

Representations of Christ, the Virgin and the saints multiplied inside churches via sculptures, altarpieces, squared stone, ironwork and stained-glass windows.

At the end of the Middle Ages and the beginning of the Modern Age, a great scientific and technological milestone was achieved, namely the invention of the printing press by Johannes Gutenberg. Thanks to this invention, it became possible to transmit ideas, writing, instructions and recommendations on both sides of the Atlantic.

It was in this context and on the foundation of the rediscovery and renewal of the Greco-Latin aesthetics of ancient times that Renaissance art was born. However, it was not a mere copy, but rather a new starting point coherent with the humanistic trends of the day. Human beings and reason were put at the service of artistic representations, including those of a religious nature, in a context in which the Catholic Church was suffering the effects of the Protestant division in Europe whilst spreading and gaining in strength in America. Artists began, once more, to be subjects of art. The works of Raphael, Leonardo, Sofonisba Anguissola, Michelangelo, Clara Peeters, Botticelli, Lavinia Fontana, Guido Reni, Elisabetta Sirani and Caterina van Hemessen were focused on order, proportion and the recovery of perspective and volume.

A similar phenomenon occurred in the 16th, 17th and 18th centuries with the Baroque style, which also had classical roots, but was more greatly influenced by theatricality, light and shade and curves than by order, proportion and symmetry. In architecture, the works of Bernini and Borromini in the Vatican were paradigmatic, although, at that time, the religious representations of artists such as Caravaggio, Artemisia Gentileschi, Zurbarán, Rubens and the sculptor Luisa Roldán also stood out.

In the 19th century and the Late modern period, religious representations in Europe have followed the same patterns as in past eras. In spite of the fact that, in the 19th century, artists such as Goya and Overbeck sought to renew the aesthetic tenets, representations of Christ and the Virgin have remained close to the stereotypes, which is normal if it is taken into account that Neoclassicism, Romanticism and new historicisms reintroduced artistic styles from the past.

In the 20th century, there was a decline in religious representations in the fine arts, partly due to a strong decrease in religious sentiment and partly to the fact that the historical avant-garde did not consider the natural world or religion to be visual points of reference. However, religious art continued to exist, linked to three main trends: expressionism, with the works of Nolde and Otto Dix; surrealism, with artists such as Chagal, Picasso and Dalí; and, lastly, the impressionism of painters such as Sorolla and Corinth. Other artists, albeit in more minority trends, also made room for

representations of Christ, as was the case of the symbolism of Denis and academicism of de Giorgio de Chirico and Sert.

Sub-theme 3. Oral and Written culture in Europe: traditions, books, the press and the Internet as instruments for the dissemination of ideas

Of the many historical sources which exist, one which particularly stands out is orality, specifically due to the fact that oral communication has existed since the dawn of humanity and, therefore, was the first method for the spreading of ideas, beliefs and scientific discoveries.

Oral tradition implies the maintenance, dissemination and transmission of the memory of the first human societies. Proverbs, traditions, songs, stories, fables, myths and epic narratives were of great importance when communicating past experiences for large groups of people who did not yet use writing. Indeed, even after the appearance of writing, the majority of people still relied on orality as they were not able to write.

Today, oral sources are still a basic resource for finding out about recent processes in the words of their protagonists. This enables the historian to consult not only official versions, but also those told by the common people.

The invention of writing in Sumeria made it possible to record the mythological explanations brought about by the gods on Earth. However, at the same time, it also made it possible to transmit practical knowledge humankind had acquired by itself over greater distances.

In this way, rites and religions (and representations thereof) spread all over the world. Indeed, a whole literary genre was contained within the mythology and gods of the religions of Mesopotamia, Egypt, Greece and Rome.

The earliest form of writing known today is cuneiform, which was used in the Sumerian Empire and was inherited by other Mesopotamian cultures, such as the Assyrians, Chaldeans, Semites and Babylonians. Incisions were made with the wedge-shaped tip of a wooden stick in soft clay tablets.

The origin of writing is unclear. It is known that humans have an innate need to communicate (a shared characteristic with all other animals) and that the social needs of Prehistoric times enabled people to function via orality. However, written language appeared between 3500 and 3000 B.C., thus indicating that writing was not a need associated to the earliest societies.

Perhaps the complexity of the earliest sedentary societies led to the creation of writing systems to enable a better organisation of the space (the land), crops, possessions or to record trading activity. This administrative function is one of the main hypotheses for the appearance of writing based on the prior discovery of archaeological elements known as “tokens” made of clay which made it possible to carry out reasonable accounting for certain elements. Other possible valid hypotheses for the birth of writing could be religion or science and the need to explain natural events or to consolidate previously discovered knowledge.

Egyptian culture was of great interest in this regard. Political and religious power coexisted in Egyptian civilisation in the figure of the Pharaoh, who was considered to be at one with the gods and their designs. The Egyptians were also the first to put into

writing the foundations of scientific culture. Indeed, the consolidation and perpetuation of scientific knowledge was of great importance in ancient times in order to be able to transmit prior experiences and their solutions with the aim of applying them again at a future time. There was no scientific method in the present sense of the term, although remedies and easily-verifiable empirical solutions were recorded in writing. Thus, astronomical representations arose, as in the case of the tomb of Seti I, writings on geometry with their formulae and algorithms, on arithmetic, architecture, pharmacy and chemical elements, on medicine, instruments and remedies, as can be observed in the reliefs of the temple of Kom Ombo and books of mathematical problems such as the Moscow Papyrus, the tradition of which was kept up by Greek academics and, later, by Byzantine, Islamic and Christian cultures. One element shared by both Mesopotamian cuneiform and hieroglyphic writing systems were their peculiar ideograms: a style of writing based on lines and drawings depicting ideas or concepts. This, along with the fact that only official scribes knew how to write, hindered the expansion of writing. However, from the Middle Kingdom onwards, Egyptian ways of writing became more complex and useful, giving rise to the first proto-Canaanite and proto-Sinaitic alphabets, in which symbols were attributed to consonants in such a way that it became possible to write complete words based on their sound. This enabled the writing of proper nouns, adverbs, verbs and places. In addition, it became possible to put different languages into writing by employing the same system of symbols.

It was in Greece that the complete alphabet took shape and its use became widespread. Based on Minoan and Phoenician writing, the Greeks created a system which gave their own letters both vowel and consonant sounds, thus enabling them to communicate with the most distant peoples with whom they traded in the Mediterranean.

The Romans took the Greek alphabet as a model and complemented and modified it via changes according to their own communication needs. Thus, the Latin alphabet as we know it today was born and came to be used around the world due to the expansion of the Roman language around the Mediterranean and even beyond the borders of the Empire.

Along with the way of writing, it is also of interest to know the instruments employed to enable the preservation of many ancient writings up to the present day. As mentioned above, in Mesopotamia, tablets of soft clay were marked whereas, in Egypt, hieroglyphic writing, which was sacred, was used essentially on stones and the walls of temples.

One of the most important changes and advancements in writing took place in Egypt with the appearance of papyrus. Using the soft fibres of a wetland sedge, it became possible to create long rolls which could be easily transported and stored. In order to be able to write on papyrus, new vegetable, mineral or animal inks were needed to facilitate writing without the need for sculpting or making grooves.

However, papyrus, due to the fact that it was of vegetable origin, was prone to deterioration or consumption by fire, damp, water, etc. Thus, the ancient Greeks created a new, longer-lasting, way to record writing: parchment. Parchment scrolls were made of untanned animal skins and could be preserved in better conditions and for longer periods of time than papyrus. In fact, it remained the most common means

of communication throughout Europe until well into Medieval times via codices written on parchment scrolls.

The Middle Ages brought two absolutely essential advances in universal history: the expansion of paper and the invention of the printing press.

Paper was discovered in China, with there being archaeological evidence of its use in the 2nd century B.C. Fibres from hemp textiles left residue in water which could be dried and pressed to be used to write on. This material was resistant, light and easy to transport and began to substitute other materials such as wood or silk. In the 2nd century A.D., Cai Lun, who was in charge of the imperial workshop of Luoyang, managed to obtain a mixture of tissues to create paper, the use of which spread along the Silk Road towards Europe in the Middle Ages.

Following the spread of this new material came the invention of the printing press by Johannes Gutenberg between 1440 and 1450. Until that time, the transmission of ideas in writing required a large number of trained scribes and a large amount of time. Gutenberg invented a system of metallic letters which, when put in the correct order, made it possible to copy whole books many times and in a short space of time. The printing of books revolutionised culture, not only in Europe but around the world as it increased the presence and number of books, avoided ecclesiastical censorship and reduced the cost of books, which became the true motor of the scientific revolution and the transmission of knowledge of the Early modern age.

The last great change to revolutionise the history of writing arrived in the 20th century with the emergence of digital technology. Computers, laptops, mobile telephones and tablets have provided a new medium for writing and a means of communicating and spreading messages instantly to millions of people all around the world. Although the letters and messages are essentially the same, a qualitative change has been wrought by the expansion of knowledge and information on a worldwide level. It is also true that this dissemination of scientific knowledge has also led to the challenge of combatting disinformation, lies and post-truth, which have also spread at the same speed. For this reason, history as a school subject should focus its efforts on the use of sources, evidence and active research methods in such a way that students can learn to differentiate between trustworthy and untrustworthy sources.

Sub-theme 4 The construction of history as a narrative. From academic subject to genealogies of power and the use of history

The first texts with overtones of historicity can be found in Ancient History. The earliest such text known today is the epic poem *Gilgamesh*. This poem apparently refers to the feats of the King of the Mesopotamian city-state of Uruk and was written by an anonymous author on clay tablets around the year 2700 B.C., although the historical veracity of this character is debatable.

Cases can also be found in Ancient Egypt of inscriptions which narrate certain historical episodes, although these cannot be considered to be historical works as we conceive of the idea today due to the fact that they are propagandistic texts regarding the biography of pharaohs and significant figures of the court. This is the case of the engravings in the tomb of Harkhuf, a high-level civil servant who lived some 4200 years ago. These engravings narrate an autobiographical chronicle of a voyage to Nubia whereas the biography of Ahmose, a naval leader from around 1500 B.C.,

describes the expulsion of the Hyksos from Egypt. Also worthy of note is the poetical stela of Thutmose III, in which the military conquests of the victorious Pharaoh are exalted. This would serve as a model for other rulers such as Ramesses II and his own narrative of the war against the Hittites in the Battle of Kadesh in the 13th century B.C. It was in Ancient Greece that proto-philosophers such as Hesiod, in his work *Theogony*, began to wonder about the truth and origin of all things, the cause of what exists, endowing the issue with a certain degree of rationalisation and believing that history has laws which make it flow in a certain way. However, it would not be until the works of another Greek, Herodotus, that it would be possible to speak properly of a historical science or discipline concerned with maintaining the memory of great events which had taken place narrated via personal research, observation and oral testimony. Therefore, Herodotus is considered to be the father of history as he employed the term in the sense of “seeking” or “researching” and “presenting”. Another Greek, Thucydides, also gathered evidence and studied the causes and effects of events without resorting to divine intervention.

This period can be considered to be the beginning of the pre-scientific stage of history as a discipline. Until the 18th century, the teaching of history was directed at the education of the ruling classes and was characterised by its exemplifying role, based on glorious tales and events of great historical figures, the so-called *Historia magistra vitae*.

It was in the Age of Enlightenment that scientific history took its first steps. *The New Science* by Giambattista Vico marked a milestone in this regard by proposing for the first time the birth, progress and decadence of a nation. Montesquieu wrote along the same lines when he pointed out that causes were responsible for historical events, focusing on political and legal institutions and customs. The historians of the 18th century laid the foundations for the paradigm of modernity, the pillars of which were reason and progress. This had a great influence on many historians and economists of the 19th century.

Indeed, the position of history as a discipline was reinforced by the demands for accuracy and intellectual rigour fostered by the Enlightenment and by the intense interest in the past spurred on by Romanticism. Thus, with the Industrial Revolution and the formation of the nation-states, which extended education to all levels of society, history was introduced as a subject at university and in primary and secondary education.

Having become a subject in study plans, history came to focus on the justification of the nation-states by way of the learning by heart of the main events and figures who had played a role in the creation of different states. Along with the use of the very first textbooks, the explanations provided by teachers were the only resources students had to help them learn history in the vast majority of cases.

This model of history teaching persisted from the middle of the 19th century to the second half of the 20th century and beyond in most European countries. It was not until the last quarter of the 20th century that certain research projects began to investigate how the process of the teaching and learning of history could be improved. These projects came to have an influence on the design of school curriculums, emphasising the work of the historian and the social use of history. With time, these two trends seem to have crystallised into a meta-concept known as “historical thinking”, which encompasses skills relating to the comprehension of the past based

on the interpretation of sources and the creation of historical narratives. Historical thinking refers to the basic knowledge which must be learned and implies mastery of the so-called first-order concepts, such as information, dates and facts, and of second-order (or methodological) concepts related with historical relevance, the use of historical sources such as evidence, changes and continuities, the causes and consequences of historical events, historical perspective and, also, the ethical dimension of history. These concepts make it possible to respond to historical questions and to understand the past in a complex way.

Via the conjugation of the two types of contents of which historical thinking consists, the past becomes a useful tool in understanding how the present has been formed, thus favouring knowledge of the present context, making possible its inclusion and directing its actions towards the improvement of society.

Glossary of concepts:

- Empiricism: A scientific approach indicating that knowledge comes from the experience and observation of facts.
- Religious art: Iconographic representations that refer to individual or collective beliefs.
- Iconoclasm: A social belief advocating the destruction of images due to their impossibility of representing the divine.
- Orality: The transmission of scientific knowledge before the appearance of writing.
- Printing press: An invention enabling the automatic reproduction and copying of books.

Web resources

Chronological axis in Genial.ly:

<https://view.genial.ly/61dff2c7a16f1f0d77e6b509/interactive-content-science-and-culture-in-europe>

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