The Perception of Color and The Meaning of Brilliance Among Archaic and Ancient Populations and Its Reflections on Language

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Introduction

Although it may seem strange, it is a fact that color in archeology has been underestimated and its importance in building the biography of objects and bodies has long been ignored by archaeologists. Only recently, thanks to the work of anthropologists, linguists and cognitive scientists, archaeologists have begun to realize that color or the lack thereof is not a simple artistic expression or lack of it. On the one hand, this idea of art, as an abstract concept, is borrowed from art history, resulting in misunderstandings and ethnocentric biases. A decoration on an object, on the other hand, is considered useful only to classify styles and dates, but has only recently been considered a real source of information to include at least a small part of the mental world of our ancestors. 

With this interdisciplinary synergy now several archaeologists look at objects and landscapes in a more 'colored' way, although in Italy it continues the bad habit of inserting tables with black and white drawings of objects and tombs (although there are issues of cost, why do they publish color photos in large numbers and detail abroad?), making it virtually impossible or at least very difficult to re-interpret the findings, given the difficulty of seeing the objects in person (especially if not exhibited, as well as the data from a dig), a fact discouraged in every way by the bureaucrats in the Museums and the Sovrintendenze, the almost universal prohibition (only recently slightly weakened) of taking pictures in Italian museums, the disastrous habit of destroying the context in museum showcases, halfway between the exposure of the 'beautiful' object, the 'exotic curio', and the arid catalog of warehouse shards and pieces of metal in possession of the museum. The visitor thus is half amazed, half bored, but it certainly does not come out more informed. Decades have passed since Willey and Phillips (1958) stated that "archeology [...] is anthropology or it is nothing," and Lewis Binford wrote Archaeology as Anthropology (1962). In Italy, however, anthropology is not a part of the academic curriculum of an archaeologist, while the elitism of Italian archeology, so at odds with the rest of the Western world, as well as its theoretical provincialism, certainly does not help get out of an ivory tower that increasingly looks like a prison. 

Thanks to a series of disputes between relativists and universalists about color perception and the relationship between language (words that indicate color), culture and psychophysiology, the discussion on colors, their meaning and their perception, has also reached archaeological studies. The important Colouring the Past anthology edited by Jones and MacGregor (2002) represents a significant step forward, albeit not the only one. In fact, even if European archeology is lagging behind as to the studies on color, brilliance and their meaning, American archeology has long produced interesting books and articles, also helped by the fact that several significant evidences came not only from the excavations, but from the writings of the early explorers, conquerors and traders. At the same time, a series of ethnographic studies on populations once defined 'of ethnographic interest' discovered how 'la pensée sauvage', to quote Lévi-Strauss (1962), works and orders the universe. In 1997, Saunders and van Brakel, in an important article, challenged the results, purified from statistical anomalies, carried out for several years by a number of scholars, among whom the most important ones are Berlin, Kay and Merrifield, using the Munsell cards. These authors also criticize the overestimation of physiological perception of color in order to support the universalism of color terminology and doubt that there is an independent color neurophysiological way. Saunders and van Brakel, in their criticism of the methods used and the results produced by Kay and co-workers, present a number of examples that are very useful to
understand how hue and brightness are not opposites, but they are seen in a holistic manner by many cultures, including many cultures of the European past.

For example, a common Indo-European root *ghel-, which means 'come on', 'rise', 'appear', 'become', 'swell', which implies both 'grow' and 'send glow, shine', may in different contexts be associated with red, gold and green colors. In Sanskrit hari is translated 'ruddy, golden' greenish '(Wood 1902: 37-38, n. 57; according to Wood the primary meaning of *ghel- would be 'sprout', 'spring', hence 'grow, turning green' and 'ray', 'glow'), while in the Christian Middle Ages red and green were considered interchangeable, and of equal value as dual components of the natural or mystical light. So the Latin and French words glaucus, ceruleus and bleu could mean both blue and yellow (Gage, 1993: 90), while there are other words that mean 'blue / yellow'in other Indo-European languages: as a matter of fact, the Serb-Croat adjective plavi (blue) is still used to define blond hair (Kristol 1978: 226), an interesting detail that also affects the color of the hair of the heroes in the Homeric poems.

Yellow-blue and red-green

McNeill (1972: 30-31) points out that a term that means both blue and yellow appears in various contemporary Slavic languages: we have already seen the Serb-Croat plavi, which means blue, but it means 'fair-haired' speaking of human hair. In Russian polovyj refers both to blue and yellow, and so the Polish plowi and the Czech plavyj, all words that derive from a Proto-Slavic pole. The phenomenon of clumping blue and yellow together also appears among the Ainu of Japan, and elsewhere. In Daza, a Nilotic-Saharan language in Eastern Nigeria, zedo means blue and zedo yellow, but also bright yellow and violet. In the language of the Mchopdo Indians of Northern California the term epoti means sky-blue, violet and blue with a yellow tinge, and the phrase epotim papaga means 'the yellow of an egg'. In Chinese and Japanese the same characters used for the blue of the sky and the sea also describe a sallow complexion, especially in old age. In Latin, McNeill remarks, flarus means both yellow and blond and corresponds to Old High German blao, the Medieval German blau and Modern German blau. McNeill also notes that there is a close relationship between red and green in many languages around the world, also because these colors represent two different stages of the same plants or fruits. In Ainu hu means both red and green, and with the meaning of fresh or green it appears in words such as bu-ham, green leaves, bu-kina green grass and bu-ni, young tree, but in other contexts bu means red, as in bu-turex, red fruit. In Chinese and Japanese the ideogram character for 'green' is composed of 'red' and 'fresh' and indicates the color of young plants and fruit, i.e. immature. Why should a language, discriminating according to brightness instead of hue, be more primitive, in accordance with the 'stages' developed by Kay and his collaborators and the supporters of hierarchical universalism? Why defining the sky 'blue' is more analytical than calling it 'celeste' as in Spanish and a number of Italian dialects, as well as in Mesoamerican languages that borrow from Castilian (Bolton 1978 Harkness 1973 MacLaury 1986 1991 1979 Mathiot ) ? It is more analytical defining the sky blue or bright as in Mursi (a language of Ethiopia, Turton 1978: 366),clear, serene as in Sanskrit (Hopkins 1883 cf. Wood 1902), whitish as in Batak (Northwestern Sumatra , Magnus 1880), green as in Me'phaa, the language of the Tlapanecs in the state of Guerrero, Mexico (using the Spanish word 'verde', Dehouve 1978), or not defining it at all chromatically as in a series of dialects in central-southern Italy (Kristol 1980: 142, see also Saunders and van Brakel 1997)?

Modern Europeans are used to distinguish the hue, but it is a factor contingent both geographically and temporally, as we shall see, even in Europe. This fact is verified by a number of translation problems, such as those arising when Sanskrit (an Indo-European language, Hopkins 1883) and Arabic (a Semitic language, Fischer 1965, Gtje 1967) oppose hue to brightness. While a green or blue skin in Arabic and Sudanese (Bender, 1983) should be considered a metaphor, Homer's Greek presents intractable problems of translation discussed by many scholars about the distinction between hue and brilliance (Hickerson 1983, Irwin 1974, Maxwell -Stuart 1981). Skard (1946) provides more than fifty sources that discuss these issues in the pre-1940 literature, Maxwell-Stuart (1981) occupies at least two hundred pages to discuss the use of the Greek adjective glaukos. The fact is that, as we shall see, the Ancient Greek color terms are problematic because they have more to do with brilliance and sparkle than hue. However, the sensitivity to the glossy surface and the glitter that appears in many Homeric descriptions are related to the dimension of time and movement as distinct from immobility in the use of these terms, as it seems to be the case also for the Sanskrit (Hopkins 1883). Hence, it is a more complex fact than saying that the Ancient Greeks were more interested in brilliance than hue.

The expressions of color in Yeli dnye language of Rossell Island, Papua New Guinea (Levinson 2000), are interesting because they have dubious basic words of color, since they are all complex expressions, while the ethnographic observations show little interest in color, since there are currently no artistic expressions or colored
manufactured items, except the baskets woven by women with the base in natural color and black / blue patterns. There is a strong interest in shell-money witnessed by its many names, but the color is not reliable to understand the various values and there is not a special descriptive vocabulary. The Yeli scheme of expressions derived from metaphorical primary reference and the low salience of the entire system does not seem an isolated trait, but it is shared by other languages in Australia, New Guinea and perhaps elsewhere. The Yeli, as most unwritten languages, does not have an abstract word for 'color' and one normally does not ask 'what color is it?' an object, unless it is a young man who uses the English loan word 'color', an innovation confined to those young people who went to work outside the island. Instead, one normally asks: Its body, what is it like? or Its body, how does it seem? ', which can refer to any perceived quality such as the size or the taste, and the sentence suggests that the interlocutor responds by making a comparison. So in Rossell they prefer to say 'The man's skin is white' instead of 'the man is white', and 'That bird, how it looks, what does his body look like, its appearance?'
'It is white in appearance' (Levinson 2000:10). The colors are not a property of an object, but of the relevant surfaces of an object. Conklin [1955: 341 n.] found the same mechanism among the Hanunoo of the Philippines. The lack of a taxonomic structure of the color makes it hard to be sure which are the boundaries of a lexical field, especially using imported stimuli such as Munsell tiles.

Radiant-not radiant appearance, skin, fur and surface

Philologists have long maintained an 'evolutionary' point of view different from that of universalist psychologists and linguists; they argue that languages have slowly developed expressions that denote hue from the names of objects, words from a limited context and terms contrasting brilliance. So also the superordinate terms for 'color' in the Indo-European languages are restricted in context, such as those that relate to the type of color of the hair or fur, while the descriptors of brilliance and object names are clearly a fundamental source of color expressions in the history of Latin and ancient Greek or even English.

Lyudmila Popovic (2007: 405-20), discusses the opposition 'non-radiant/radiant' focusing on the Slavic languages, and explicitly refers to studies on Australian languages that separate the 'color' terms depending on their visual conspicuity, and the visual 'radiant, radiating' conspicuity is associated with the sun, fire and blood. According to Popovic, who examined the 19th-century Russian, Ukrainian and Serbian folklore, the color prototypes have two aspects, positive - radiant/not-radiant - not-positive - secondary, a dualism that appears to descend from Proto-Indo-European languages. It is worth mentioning that a contamination frequent in Serbian folklore is that between green and gray, always related to the bright, shiny quality of metal surface, fur or plumage, as in the expressions 'green horse', 'green falcon', 'green cannon', 'green knights', 'green sword' and so on.

Starko (2013: 161) also notes that socio-linguistic factors may influence the use of color terms, as in the case of two Ukrainian adjectives that denote the color blue. The speakers of Ukrainian, for example, consider the term blakytnyj as a purely Ukrainian word even if it is a loan from the Polish and bulubyj as a loan from the Russian, because it is very similar to Russian goluboj, even though it has been in use in Ukrainian for longest than in Russian. Based on these prejudices many speakers prefer blakytnyj to bulubyj to say 'blue'. Moreover, bulubyj commonly designates male homosexuals and therefore is avoided for fear of misunderstanding, similarly to the English 'gay', that has ceased to be used in the traditional sense of carefree or bright and a little garish. Finally, the Russian word krasny today means 'red', but previously it meant 'beautiful' as the Russian adjective krastyj, beautiful, and the Czech krasny, beautiful. So the famous Red Square in Moscow when it was called in this way meant 'beautiful square' (Barber 1991: 230).

Another particularly important example of the union of color and non-color concepts comes from ancient Greek: the adjective χλωρός, cloros, usually translated 'green', refers to both wood and sea water, but also to sand, people, cheese, fish, flowers, fruits, gold, blood and tears (Liddell, Scott & Jones 1968 sv). In fact, this use suggests a range that goes from pale green to greenish yellow to yellow, and involves more or less any pale color. The explanation lies in its proto-Indo-European root *ghlo-, ghel-2 variant of *ǵʰloū- sparkle, shine, connected with χλάσσω, cloraïs, green, and χλός, klos, the green of new growth. Words such as yellow, gold, gleam and gleaming (twilight) came from this root *ghlo-, ghel-2.

But ancient Greek also used cloros to describe something that is wet, like green wood, something full of sap, something living, fresh water, something just cut or picked, budding, immature or unripe, etc. (Liddell, Scott & Jones 1968 cloros sv), all concepts that explain its use with fish, fruits, flowers and blood. Homer also applies cloros to honey and the nightingale, but Pindar describes the dew as cloros. So in the case of the nightingale and dew it can be understood as referring to the 'pale' hour of the early morning. Euripides uses cloros for blood and
tears and here it is evident the meaning of 'wet' and also of something that is somehow 'shiny, light-reflecting' because it is liquid. On the other hand Empedocles, one of the first philosophers to deal with color, described it as a light or white, dark or black, red and yellow, while Xenophanes described the rainbow as composed of three bands of color, purple (violet), green / yellow and red. The imperative of a well-defined categorization of colors tends to disintegrate when certain aspects of hues are applied to contexts only vaguely chromatic, to indicate a connection between growth and maturity or between color and value, or only a change of color, not color in itself. Uncertainty arises when it is unclear whether a word refers to color or aspects of growth. For example, in Lokono (Arawak) the term imurore indicates 'unripe, immature, green, pale yellow, koreto indicates ripe, red, orange, deep yellow, and the term bunaroto too mature, rotten, chestnut brown, brown, reddish brown, purple. The languages of ancient and modern cattle breeders have similar characteristics: Magnus (1880) noted that the African Xhosa distinguished twenty-six colors for the cattle, but did not have words for blue and green. Many other scholars have noted the difficulty of separating the color from cattle speech, as Evans-Pritchard did for the Ngok Dinka (1933-5) and the Nuer (1940), Lienhardt (1970) for the Dinka, Fukui (1979) for the Bodi, Tornay (1973, 1978c) for the Nyangatom, Turton (1980) for the Mursi, all African populations. But similar problems, i.e. if a chromatic speech is applied to cattle or if a cattle speech is applied to color and whether it makes sense to force a distinction, have also been applied for cultures where the horse is important, with Radloff (1871) for the Kirghiz, Laude-Cirtautas (1961) for the Turks, Hamayon (1978) for the Mongols, and Centlivres-Centlivres-Demont (1978) for the Uzbeks, Hess (1920) for the Bedouin Arabs. Bruce MacLennan (2003: 3) notes that the Latin word 'color', which means both external appearance and composition as well as color, comes from an Indo-European root meaning to cover or hide and gives us words such as building, hull, helm, occult, cell. In other words, color originally means 'what covers' an object. In addition to this we must remember that the primary meaning of the Greek word chrôma is skin and only secondarily complexion and color, and it is derived from the Indo-European root ghreîn-, which means to rub or grind (see Wood 1902:70). One form gives the Greek chrôs, which means skin, flesh, cover and only secondarily complexion and skin color, and chrôma. Even in Greek the concept of color refers to the aspect of the surface, in particular as an indicator of an internal state, as in one's complexion. Similar observations should be made for other colors of archaic Greek. For example πορφύρας porphûras is usually translated as purple, famous as the royal color and subject to strict laws regarding its use, but lexicons also give the meaning of dark red, crimson and maroon. Homer uses it to describe different things such as death, blood, water, clouds, various types of cloth, and finally a ball.

The problem of the blue-green color

Many languages do not have separate words for blue and green and use a term that covers both: Vietnamese uses xanh for both the leaves of the trees and the sky, Thai uses khiaw, green for everything except when referring to the sky or to the sea, where it means blue. The Korean word pureu-da is used for green and blue, the Japanese ao, blue, is also used for green in certain words such as the 'green' of the traffic lights. In various traditional Celtic languages glas can refer to blue, but also to certain shades of green and gray; although glas is often translated 'blue', it can refer to the color of the sea, grass or silver. In Old and Middle Irish glas was an umbrella term covering shades from blue to green, to shades of gray, referred to the color of swords, stones, etc.. Actually there are two Gaelic words that indicate green: glas and uaine. According to Black (1986) glas refers to the green in the yellow-green part of the spectrum, while uaine would be associated with pale greens. MacBain, gives for Scottish Gaelic glas, gray, Irish glas, green, pale, Old Irish glass, Welsh and Breton glas, green, from the Proto-Celtic root *glasto-, green, from Proto-Indo-European *ghel, which in German provides glast, shine, from the root glas, which gives probably the English and German words glass. In Welsh, as in Gaelic, Llydaw, glas / Liath, glas, do not really mean blue and gray. We use glas for the grass, the waves of the sea and also for gray hair, but we use Liath for the sky, for gray hair and other gray things like rocks and also for brown wrapping paper. Falileyev in his Etymological Glossary of Old Welsh (2000: 61-62) for Old, Middle, Modern Welsh, and Old Breton gives glas as blue, green, and refers to taeicinctiniun, the hyacinth color. In addition he mentions the Middle Cornish word glas with reference to the Latin term glastum, woad (a plant used for a blue dye). He also mentions the problematic glaucous and errnican that we will see later. There is also the Welsh term glaslin, Middle Welsh glasslin, consisting of glas, meaning blue and liu, color, that would be the hyacinth, which we will see later.
Green stones: jadeite, nephrite, serpentine, etc.

Although in Arabic there are separate words for blue and green, in classical Arabic poetry, the feminine term al-akhadra (green, akhadar), 'the green' is an epithet referring to the sky (feminine in Arabic). The modern Chinese language distinguishes between blue and green, but a more ancient word, qìng, is still used and covers green, blue and even, sometimes, black and corresponds exactly, also in the ideogram kanji, to Japanese ao. The examples could go on, but this linguistic discussion poses the question: what did our Neolithic ancestors see, to paraphrase the title of an old movie, in search of the green stones? We must not forget that the name 'green stones', used to refer to the axes of jadeite, nephrite, serpentine, etc. deemed of so great value they were traded from Ireland to Bulgaria and from Scandinavia to Italy, is a term coined by archaeologists, who see the axes green. It is quite possible that the ancient inhabitants of the Neolithic villages called them blue, yellow, and even red, or, following the example of certain Australian or Melanesian languages, used a term that meant 'as bright as the sun' or 'bright like the water reflecting the sun', or 'radiant mystical light like the mystical essence of blood and fire', etc. Classic Mayas valued jade not only for its preciousness and beauty but also for its symbolic value, which included its association with maize, and the centrality of the sovereign power, as well as the embodiment of the wind and of the soul-revitalizing breath. The Mayan king was the living embodiment of the axīs mundi, both as a green tree and the jade heath in the center of the temple. For the Mayas jade represented the water as well as the young corn plant, both vital for human life. Because of its close relationship with the breath, jade was also an important component of funerary rituals and rites of invocation of gods and ancestors. In particular, the earrings of jade carved in floral shape were considered the supernatural source or the passage for the soul-breath, often depicted as a pearl or a snake that emerges from the center of the floral cup of jade (Taube 2005). Many of the symbolic meanings and images of Classic Maya jade also appear in other cultures of ancient Mesoamerica, such as Teotihuacan, Xochicalco and the Aztecs, and are thought to have originated at the beginning of the Olmec Middle Formative period.

Michael J. Snarskis (2003) emphasizes the symbolic value of jade due to its shiny and reflective surface, very different from that of gold because of its depth, as if you looked the reflection of the plants in the water. It is a quality of paramount importance from the point of view of shamanistic religions as a symbol of mystical life force responsible for the survival and growth of the plants, a subtext, that is, of agriculture. Snarskis's article is particularly interesting because it deals with a peripheral area of Mesoamerica, Costa Rica, which, however, was one of the areas of origin of jade and gold. It gives us a starting point to understand how the symbolic change from green stone axes to copper halberds and daggers occurred in Europe, drawing a parallel to a similar change between jade and gold in Costa Rica. The archetypal form of Costa Rican jade is the so-called Ax-God, a pendant where a human, animal or composite effigy surmounts a polished ax-shaped blade with a strong sense of three-dimensionality. It is a transformation of the previous Olmec tradition of carving quite large axes that were more miniature stelae than ornaments, used as funerary offerings and perhaps as political gifts. The Child God with the face of a jaguar often appears on these axes as an expression of fertility and guardian of the rulers. The European green stone axes do not represent figures, are more 'abstract', but we can hypothesize they did represent the embodiment of sovereignty as a source of fertility and as embodiment of divinity. In a sense, the ax is the metonymy of divine sovereignty crystallized inside the translucent stone. The change from jade to gold in the case of Costa Rica took place approximately between 400 and 700 AD, when the work of high quality jade virtually disappeared, replaced in their symbolic role by metal objects originated for the first time in Andean South America in 1410 B.C. in the site of Mina Perdida on the central coast of Peru. Gold and its alloys (tumbaga, guanin) represented the gods and the superhuman ability of the shamans, a substance that allowed them to see the 'right way' in the Otherworld within the prevailing cosmogony. The peoples of Central America and southern Colombia classified metal objects according to a taxonomy quite different from that of their Spanish conquerors. We should remember that even before the shamanic elite entered the ramifications of the effigy itself and its symbolism, they also took into consideration weight, color, smell, taste and brilliance. Nicholas Saunders (Saunders 1998, 2004) proposes an 'aesthetic of brilliance' that so far had been expressed only by minerals, shells, plants, animals (through iridescent feathers), and natural phenomena, as they appear in nature and as artifacts. So metals were included in the pre-existing, old and multisensory shamanic world of phenomenological experience.

In Costa Rica, Panama and Colombia gold ornaments were not only used in rituals conducted by special characters, but they were also worn in battle to impress the enemy, since the primary symbolism of gold represents the sun and the celestial phenomena in general. Hence, the advent of gold, with its symbolic configuration connected to the sun, the light, the male fertilizing power of the world 'above' replaced the world
An aesthetics of color and brilliance?
Gaydarska and Chapman (2008: 63-64, 65) have explored the reasons why prehistoric people were so interested in bright colored objects, and propose an aesthetics of color and brilliance that emerged in the Balkans at the beginning of agriculture and developed as a key aspect at the apex of the Balkan Climax Copper Age, affecting every type of material culture and corroborating the amazing development of goldsmith technology represented in the Chalcolithic cemetery of Varna. Following Saunders (2003: 21), who has explored the theme in pre-Columbian America (Manufacturing shiny objects was an act of creative transformation, trapping and converting ... the energy of fertilizing light in bright solid form), Gaydarska and Chapman apply the idea that bright objects became objects of social prestige to the Neolithic farmers of the Balkans, located locally in the symbolic representation of political power and elite status: 'The close association of the body of the person with the flashing beads that they wore, presumably on special ceremonial occasions, created a lasting aesthetic bond between person and thing. Since there was no other reason to produce facets other than to create additional brilliance, carnelian beads serve as an excellent illustration of Climax Copper Age aesthetics.' (Gaydarska and Chapman 2008:64).
The first farmers of the Early Neolithic regional cultures of Karanovo I / II, Kremikovci, Starčevo, Cris, and Körös exchanged a small number of objects of religious nature beyond their territories, and in particular ceramics in strong bright colors (Chapman, 2007; Borić, 2002), polished stone ornaments and tools, animal and human bone objects, ornaments made from shells such as Spondylus gaederopus and objects made from copper or copper minerals. These objects increased the previous foragers' spectrum of both color and brightness, expanding the possibilities of metaphorical connections between objects of the same color and contributing to the creation of new worlds in the Neolithic (Whittle, 1996).
In general, Gaydarska and Chapman detect an overall continuity of aesthetic appreciation, and thus political significance that lasted thousands of years, from 6500 to 3500 Cal BC. In essence, the contribution of color and brilliance was important for more than a hundred generations, from the beginning of the Neolithic to the apex of the Bronze Age, and led to the introduction of pottery, polished stone and copper metallurgy. Every technological change allowed the skilled craftsmen and those for domestic consumption to create new forms whose surfaces gleamed and glistened of color and shine. In relation to metallic colors, it is possible to suggest that the previous colorful aesthetics was a pre-requisite for the choice of gold as a key item in Varna. The authors also remind us that this aesthetic was not entirely 'Balkan' in its origin and development: while the range of object-colors was considerably narrower among the first farmers of Central Europe (the Linearbandkeramik, the Linear Pottery Neolithic culture, which flourished in 5500-4500 in the middle Danube, middle and upper Elbe and the Rhine) and later cultures in the Northwest, or in coeval foragers in the northern Pontic area, the farming communities in Greece and northwestern Anatolia shared some basic object-colors with those living in the Balkans and Hungary. Therefore it seems very likely to these archeologists that the Balkan Neolithic and
Chalcolithic played a key role in the spread of the aesthetics of color and brilliance to regions further to the North, North-East and West, a role which can be further studied by geo-archaeologists and archae-mineralogists, who are essential for the study of prehistoric material culture.

Sources of natural colors
As recalled by Alfaro Giner (2010: 39-40), the ancient peoples obtained natural colors from three sources, mineral, vegetable and animal, both terrestrial and marine; the cultures of the Mediterranean and the Black Sea as well as the peoples of Central Europe used mainly organic animal dyes, while small quantities of mineral substances were used as a mordant which caused the dye plants to release their color and fixed it to the fiber. Particularly useful for this purpose were copper, tin and iron salts, potash and alum, the latter also required for tanning hides and which is commonly found on volcanic soil. Alum was traded from islands such as Lipari, Melos etc. Pliny the Elder (NH XXXV, 183 s.) speaks of two kinds of alum, one white and one black, that in fact are both iron sulphate.

The Greeks and Romans also used some types of sand, more to clean than to dye, the fuller's sand for fulling. The operation of fulling was made in special workshops called fullonicae. The woven cloths were soaked in large vats filled with water and beaten with their feet (saltus fullonicaus), scrubbed and wrung with their hands by slaves supervised by a freedman foreman. The hot water with the addition of smectite clay called 'fulling clay', combined with the energetic action of the feet, felted the wool. The cloth was then washed with urine to remove impurities, dried, brushed (i.e. brushed with thistles or porcupine skins to raise the nap), sheared, pressed and bleached with sulfur fumes.

Among the most common vegetable dyes there were those extracted from Isatis tinctoria, L. for blue, from Rubia tinctorum, L. for red and from Carthamus tinctorius, L. for yellow, among others. In the Mediterranean world vegetable tannins were also used, such as the skins of the chestnuts, as reported by Pliny (NH XVI, 26 s.). Sometimes the vegetable dye was extracted from animals associated with certain types of trees, of which the best known example is that of Kermococcus vermilio, Planch, which lays eggs in oaks such as Quercus cocifera L., or Kermes ilicis, L., that lives in Quercus ilicis, L. and Quercus iner L.. They are parasites the Latin authors seem aware of their metamorphosis as animals, and yet they classified them either as vegetable dyes, galls or oak excrecences. Fungi and lichens such as orcein or other genre Rocella, L. lichens (the focus of the Latins) to dye wool purple and even certain types of algae were used to obtain dyes, such as Rytiphlaea tinctoria var. borridula. Agardh, a red seaweed relatively abundant in the Mediterranean, used to get a dark red very similar to that of the Tyrian purple.

Purple and purplish (Purphureos)
In his Etymological Dictionary of Greek, Robert Beckes suggests that there are two different meanings of porphureos, each with a different root, that is, they are homonyms: 1) porphureos: boiling, the boiling of the sea, from the verb πορφυρέω porphureo, which means a) rise, boil b) dye purple, reddened, and 2) purphureos: purple, from the noun πορφυρός, porphuros which means purple dye, purple shellfish, purple clothes. As for Pierre Chantraine, in his Dictionnaire de la langue talmudique Grecque he reaches similar conclusions, two words from two different roots, which were later confused in Greek but that still retained a different meaning in Homer's days.

Liddell and Scott (1889, sv) in their Dictionary recommended the definitions 'dark glistening' or 'shimmering', which imply an essential component of light in the word porphureos. Homer also uses three times the word ἀλπόρφυρος aliporphuros, purple-sea, consisting of als, sea and porphura, purple, and in all three cases he refers to yarn and fabric and therefore, while speaking of sea water, it is clear that there is a chromatic component, given that porphura means 'purple dye'. It may be a metaphor that describes some quality or color of the sea, by the reference to the marine snail of the genus Muricidae (Hexaplex trunculus formerly known as Murex trunculus) from which purple dye was obtained from boiling.

Death, θάνατος, thanatos, is often associated with a dark color; in Homer with μέλας, melas, black but also with a blue crimson and purple. Porphureos thanatos, πορφύρος θάνατος describes a bloody death in the Iliad, and this may be due to the color or other qualities of the blood (which flows in streams as a spring). In a simile Homer uses the word purphul in reference to the rainbow, which in this case is a portent of war or a storm, and the purphul cloud in which Athena is hidden is almost certainly also a storm cloud because of the context. Do not forget that from what we can glean from Proto-Indo-European as well as the ancient Greek religious terms, the rainbow, represented by the Greek goddess Iris, is connected with the war and Homer in the Iliad calls her 'she of the stormy foot'. In this use of purphul there is also the idea of 'inflation' given by the storm clouds, as suggested by Beckes.
In conclusion, the variety of uses of πορφυρέος, purphureos, makes the term difficult to define, but what interests us is that it can either refer to a color or a movement or certain qualities of light, which can come together, as in the case of the union of color and movement in the bloody wave summoned by the river god Xanthos (which means 'yellow') that overwhelms Achilles in the Iliad. To Homer's audience the word purphureos first referred to the play of the light that produces brilliance on troubled water and by extension any play of sparkling, glossy or shiny color, but it also referred to a negative sense of fear, since the adjective, usually associated with blood and death, is referred to the 'Trojans, or refers only to the numinous, portentous of the divine (Zeus, Athena, Xanthos). This conception of the aspect of the surface of an object explains why Homer calls 'bronze' the color of the sky (as a matter of fact, the archaic Greeks believed that the sky was an upside down metal bowl, as we will see later), in reference to the glare of the metal, the sky and the sea, and wine-colored sheep, evidently intended as moving surfaces, if we think of the bubbling wine in winemaking.

Compared to μολυ, black, purple in Homer’s Greek is less dark. It contains elements of light and, according to Irwin (1974: 17-19), is positioned within the red-yellow color range. In fact, even in the classical period, the sea is described as purple. Aristotle admits that the sea can have that color depending on the angle of the wave in De Coloribus 792nd, and Virgil uses the phrase 'purple sea' in the Georgics IV 373-4.

Purple came from shells found on the coastal area of the eastern Mediterranean and, of all the colors in the spectrum of red, it was the most valued by the ancients. Purple dyes were obtained from shells of the Muricidae and Thasididae families, but the Royal Purple or Purple of Tyre came from Bolinus brandaris shellfish (once known as Murex brandarius). In addition, purple was produced from Hexaplex trunculus (once known as Murex trunculus), Stramonita haemastoma (once known as Purpura haemastoma). These three mollusks were the most expensive and valuable. The animals gathered in shallow water in spring and the abrasion and breakage of the shell (produced by the animals themselves who are cannibals) produced a milky liquid from which it was obtained the purple dye. Exposure to air and light caused the fluid pass through a series of colors, first whitish, then lemon yellow, greenish-yellow, then green, and finally purple or scarlet.

The fluid of Hexaplex trunculus changed photochemically into a dark blue-violet, while that of Bolinus brandaris provided a scarlet red. By mixing the fluids of different shellfish, and stopping the photochemical process in different parts of the process, dyers produced the colors yellow, blue, green, red and violet. In the Middle Ages the term 'purple' was loosely applied to various shades of red, but today it is applied to a mixture of red and blue in varying proportions. The industry of the purple dye dates back to the pre-Classical period, but had its greatest development in the classical period. The Greeks applied the term purphureos to all these shades (McNeill 1972: 27-28).

According to various authors (Reese 1987, Stieglitz 1994, Burke 1999) the first production centers of purple are found in the eastern Aegean Sea, Crete and Lesbos, in south-western Turkey and in the Arabian Gulf, but the Minoans of Crete seem to have developed the industry of the Royal Purple to an industrial scale, exporting both colorful textiles and technology in exchange for raw and finished metal items from Anatolia and Mesopotamia during the Middle Minoan period between 1700 and 1600 BC, spreading the technology to the Levant, Tyre and the Phoenicians. Lilian Karali-Giannakopoulos (2005: 161-166) writes that, according to data currently available, the origin of the manufacture of the purple cloths should probably be sought at a time before the Recent Minoan period, that is, before the fifteenth century B.C.

Particularly interesting are the written records of the Linear B clay tablets, a fourteenth-century. B.C. hieroglyphic form of writing, common to Mycenae, Pylos and Knossos. Most of the evidence is made up of accounting documents that provide important sources of information on the life of the palaces. Four of these tablets found at Knossos refer to purple-colored textiles. In a tablet of the thirteenth century B.C. the word po-pu-re-jo (the last syllable -jo- is uncertain) means purple and probably refers to the Royal Purple type called με-να-κο-τε-ρο 'of wanax', i.e. the king. These and the presence in this site of pottery painted with the representation of sea snails and shells of Hexaplex trunculus and Bolinus brandaris in the levels of the Middle Minoan, made scholars believe in a local production of the purple. Since 1000. B.C., the development of a flourishing of artisan shops producing a wide range of products including purple, led to the prosperity of Sidon and Tyre. The archaeological evidence indicates that approximately seventy manufacturing centers developed in the Mediterranean basin, from Asia Minor, to North Africa and Western Europe, and that the Phoenicians became the most active traders of textiles.

The Phoenicians developed the two most valued types of purple, the so-called Royal (Imperial) red purple or Tyre purple also known as blatta or acyblatta, and in particular the most expensive dibapha (with double dyeing bath) and the purple-blue 'amethyst' (hyacinthine, we will see later). The Phoenicians had manufacturing bases
scattered throughout the Mediterranean and what was produced was dependent on the species of mollusk predominant in the area: in Tyre it was used *Bolinus brandaris* (that Pliny the Elder calls *diarbantes*) that provides a purplish red, while in Sidon and Sarepta it was used *Hexaplex trunculus* (that Pliny calls *pelagium*) which gives the blue purple dye. The different species of mollusk were always kept separate. In his treatise *De architectura*, Vitruvius writes that the color varies greatly depending on the geographical origin and that the murex from Pontus and Gaul gives a black (*ater*) purple dye, being the closest to the north.

As we see, more than a description Vitruvius gives us a geographical and cosmological theory: going from north to west the purple dye is bluish (*lividus*), from the east and west purple is violet, while the southern countries provide a red (*ruber*) purple dye that is also located in Rhodes and other regions near the equator. However, that the color varied is also claimed by classical authors, modern scholars and dye engineers alike, since the color is influenced by factors such as the collection period, the moon, the size and age of the mollusk and the food with which it feeds. According to Pliny in his *Naturalis Historia*, the best time to harvest the shellfish is after the rising of Sirius, i.e. after the summer solstice, or otherwise before the spring. It is therefore obvious that the purple color encompasses an entire range of colors in the spectrum of red and blue in a variety of intensity and hue. The experiments (Meiers 2013) showed that *Bolinus brandaris* provides most of the shades of red, from pale pink to dark reddish brown on samples of wool, while silk shades take a little more bluish hues. *Hexaplex trunculus* provides both red and blue, ranging from salmon pink, blue lavender, violet, turquoise and oil blue up to midnight blue. This wide range of colors can also be found in the classical authors: Pliny uses the word *ruber*, *nigrans*, *violacea purpura*, *pallor* and other words, while Vitruvius distinguishes, as we have already seen, according to the geographical origin of the shells, *ater*, *lividus*, *violaceus* and *ruber*. To these we can add combinations of colors such as amethyst, which is according to the Latin writers a mixture of *bucinum* shellfish and *pelagium* (*H. trunculus*), and Tyrian purple or *dilophtha*, a double dyed hue obtained by dipping the cloth first in the *pelagium*, and then in the *bucinum*. *The bucinum* of the Romans actually is one of several types of Triton shell, *Charonia* family, of which the North Atlantic type is used in the Middle Ages to color in red parts of illuminated texts; the *pelagium* is a real purple mollusk (*Gr. porphura*, *Lat. purpara*, *pelagia*, identified with the shellfish *Bolinus brandaris* or *Hexaplex trunculus* [in classical and medieval times also with the *Murex tribulus* found in the Indian and Pacific Oceans].

Given that the color of the *bucinum* does not last, it was never used alone, but always in combination with the true purple snail to produce a variety of dyes. Mixing *bucinum* with black *pelagium*, the juice of true purple snails, the precious violet purple called ‘amethyst’ was obtained. Through the process of double dyeing, first in semi-boiling *pelagium* then in *bucinum* they obtained the Tyrian purple with the color of clotted blood, which appears black when viewed straight, and it shines when exposed to the light. In Caesar’s time a pound of violet wool cost 100 denarii (about 60 euros), the Tyrian purple over 1,000 denarii (about 5400 euros). Mixing the pelagium with other substances, such as water, urine and orecin (name commonly given to some lichens of the genera *Roccella* and *Lecanora*, especially *Roccella tinctoria*, which yields a violet dye) they obtained the colors bright purple, blue heliotrope (purple-pink, from the Heliotrope flower; another name for this shade is bright lavender), blue mallow and a yellowish violet. Other colors were obtained with the combination of different methods of dyeing: dyeing the fabric first with the color violet, purple and scarlet (from the kermes obtained from *Coccus ilicis*), then using the method of Tyre they obtained the *tyrianthinum* (between purple and violet) and the variety called *byzinum* (red-violet, from the Greek *byzge*, a variety of *primus* or *Quercus cocci/a*; see Pliny *NH* ix 124-141). For further details it is essential the work by Hugo Blümner, *Terminologien und Technologie der Gewerbe und Künste bei Griechen und Römern*, Leipzig, 1875-86 (2nd ed. 1912) pages 224-240. For a long time the purple dye was mostly homemade and the purple of Tyre was not introduced until the mid-first century B.C. and, in spite of the imperial decrees to limit their use in the private sector, cloaks with a purple-dyed edge or purple-dyed became increasingly popular. Only a complete garment made of *blatta*, the finest kind of purple of which there were five varieties, was reserved for the emperor and wearing it improperly was considered treason. The *Codex Theodosius* iv 40, i: called it *blatta* purple or *acubitella* or *hyacinthina* (*purpura quae blatta vel acubitella vel hyacinthina dicta*). From the second century A.D. the emperors became ‘share holders’ of this lucrative trade and by the end of the fourth century A.D. the manufacture of *blatta* purple became an imperial monopoly (Thurston Peck 1898: 9187).

**Hebrew Fabrics, Phoenician Purples and the Biblical Blue**

The first written accounts on the production of the purple dye come from Nuzi, Mesopotamia, about 3500 years ago, followed by the Hebrew texts in *Exodus*, about 3,500 years ago, Ugaritic, 3000 years ago, Akkadian 2,700 years ago, Greek and Latin. Archeology, however, shows that the industry of the purple dates back to the seventeenth-century-BC Crete, over 3700 years ago. The Phoenicians produced two distinct types of purple dye,
as we have seen, a blue purple or hyacinth and a red-purple or Tyrian purple, which are found both in the Bible and are called respectively tekhelet or biblical blue and argaman or priesthood purple which, along with shani tola’at (‘crimson worm’) or sacred scarlet derived from the cochinineal insect (kermes), are mentioned several times in Exodus.

The book of Exodus prescribes the use of blue, red and crimson purple for the wool fabric of the priestly vestments and the curtains of the Tabernacle, and the Book of Numbers describes the use and the color of the cloth covering the sacred vessels when they are transported out of the Temple. It also describes the tzitzit, tassels with a blue purple thread sewn to the prayer shawl. These requirements ceased to be observed after the seventh century A.D. when the industry collapsed because of the Arab invasion of the 'purple area', that is present-day Lebanon, Syria, Israel and Palestine, with the destruction of Tyre in 638 and the expulsion of the Hebrews from the Golan Heights. Following the Arab invasion the purple was produced only by the Byzantines until the fall of Byzantium in 1453 (Ziderman 1990: 98-101).

The blue color is used by the Hebrew to symbolize divinity, because it is the color of the sky and the sea halfway between the white and black of the day or night. The oral law requires that the thread of the tzitzit in the prayer shawl must be colored with the color extracted from a sea creature called Hilaizon by the sacred texts. Maimonides said that this blue shade was the color of the clear sky at midday, but the eleventh-century biblical exegete Rashi stated that it was the color of the night sky. Since the Arab invasion of ancient Israel and other areas of production of the purple in the East had brought with it prohibitions imposed on the defeated peoples by the Muslims, production had ceased and with it the knowledge of the processes and, finally, also exactly which blue shade the word tekhelet meant.

Since the tekhelet-colored fabrics were used not only by the priests but also by the rulers and nobles, due to the prohibitive cost, as it occurs for today’s big names in fashion, there were also counterfeit fabrics, i.e. colored blue from woad (Isatis tinctoria) or a dyeing plant called kala ilan, identified as true indigo (Indigofera tinctoria). Both make the blue shade indistinguishable from the precious tekhelet blue. There was a test to distinguish the real from the counterfeit tekhelet: liquid alum, juice of Greek hay (Trigonella foenum-graecum L.) and forty-day’s old urine mixed together. The sample was immersed in the mixture for one hour and if the color did not become paler the tekhelet color was authentic. If it palced, the sample was baked in a piece of unleavened hard dough of barley in an oven: if the color improved the tekhelet was genuine, otherwise it came from indigo or woad.

The archaeological findings and the studies conducted by the rabbis since the Middle Ages on the tekhelet color have revived an ancient biblical precept, reviving the ancient tzitzit tassels of the sacred shawls, which had stayed white for centuries due to the disappearance of the industry that produced blue from Hexaplex trunculus, except for the sect of the Radzyner Chasidim following their Rebbe’s opinion that the Biblical hilaizon (chilaizon) was not the Hexaplex trunculus mollusk, but a squid. Isaac Herzog (1888-1959), first Rabbi of Ireland (known as "the Sinn Féin Rabbi"), and then Ashkenazi Chief Rabbi of the British Mandate of Palestine, and the State of Israel after the independence in 1948, researched the nature of the tekhelet in his university thesis and concluded that it was a brilliant sky blue derived from the secretions of Hexaplex trunculus. Some decades later, the chemist Otto Elsner proved that the secretion of trunculus could produce a sky blue shade by exposure to ultraviolet light during the dyeing process.

A skein of violet wool found during the excavations of the first-century B.C. fortress of Masada proved that it had been dyed with genuine purple from Muricidae mollusks, but the most important evidence related to the true shade of blue, that is sky blue, of tekhelet comes from an Assyriologist, Wayne Horovitz, who explains that the Sumerian word uqnu, that describes the lapis lazuli, was used for the blue color and its range. The term was also applied to the sky and blue wool or uqunu. When the word takiltu, Hebrew tekhelet, was adopted in Akkadian the same cuneiform characters of the word uqnu were used. For the ancient Mesopotamians, therefore, the color of lapis lazuli and the sky were equivalent to the color of the biblical tekhelet. The Ptil Tekhelet Jerusalem Foundation believes that the tekhelet is sky blue and derived from the ancient blue purple dye obtained by Hexaplex trunculus and for over twenty-five years has produced hundreds of blue tzitzit strings for Jewish prayer shawls that remind the devotees of the sea, the sky and the throne of God. White and tekhelet blue is the color of the flag of Israel (Robin Ngo 09/11/2013 http://www.biblicalarchaeology.org/daily/ancient-cultures/what-color-was-tekhelet/).

Among the Egyptians, the Mesopotamians and the Hebrews sovereignty and sacredness were represented by the union of blue-lapis lazuli and gold. The Babylonian god Marduk had its representation in the blue lapis lazuli of his images and the color of his cell in the temple, the Sublime House, whose construction the king participated directly in. Also other gods of the sky were blue, like Sin, god of the moon, his body blue-azure, who was traveling on his crescent-shaped boat in the night sky. No wonder the Hebrews shared ideas about the sacredness
of blue similar to those of other great Semitic civilizations. When Moses, Aaron and the elders went up on Mount Sinai, the Mount of the Moon is the meaning of the place, to meet God, "they saw the God of Israel. Beneath His feet was like a paved work of sapphire stone, and as clear as the sky itself "(Exodus XXIV 10). The Mesopotamians and the Hebrews, however, were not the only ones to consider blue a divine symbol: in fact, Hindu gods such as Vishnu, Krishna and Shiva have blue or dusty-blue skin color, sometimes black, and so most of the avatars of Hindu deities. In Hinduism, blue is the color of infinity and the gods are an attempt by the human mind to give form to the formless Brahman (God). The blue color symbolizes the immeasurable and all-permeating reality. As the Jewish priests had a blue cap, the Egyptian pharaohs also had their turquoise and blue lapis lazuli headgear, a use reserved only to the royal court and the representations of the gods. The pharaohs also put on false beards of the same lapis lazuli blue, a color that was related to the divine character of the blue-azure hair of the god Ra (Luzzatto and Pompas 2001).

The colors of the Greek
Johann Wolfgang von Goethe was the first to observe, in his Theory of Colours (1808-10), that the Greek color lexicon exhibits a peculiar 'mobility' and 'oscillation'. The area of yellow, for example, is not clearly separated from red on one side, blue on the other, nor that of red from yellow and blue; so the term xanthos can cover different shades of yellow, from the shiny blond hair of the Homeric heroes to the reddish flame of fire, or purple (porphureos) may intrude into the blue color. Subsequently, William Gladstone, British Prime Minister and well-known Greek scholar, in his Studies on Homer (1858), had insisted on the Homeric Greeks' faulty discrimination of prismatic colors and their strong sensitivity to bright impressions (the same Greek word for white, leukos, comes from the same etymological root of Latin lux). In particular, Gladstone had dwelt on blue: in Greek the most common words to say blue were glaukos and kuaneos. During the Classical period kuaneos meant a dark color, dark blue, violet, brown and black, while glaukos, which existed in the Archaic period and was much used by Homer, could refer to gray, blue and sometimes yellow or brown, and was connected to an impression of brightness.

In the epic narrative the sky can be called iron or bronze, but it is never blue. Gladstone concluded that the visual organ was not fully developed at the time of Homer and that the archaic Greeks' eyes were still more sensitive to the light than the color, and unable to clearly distinguish both one from the other and the different colors. We are in the period of the birth and development of Darwinism, so some time later an ophthalmologist, Hugo Magnus, offered explanations drawn from physiology, leading to the development of an evolutionary pattern of the universal sense of color (parallel to the functional development of the retina) on the basis of an identification process that starts moving from colors more full of light, on the red side of the spectrum (red and yellow), to switch to those of gradually weaker luminous intensity (green, blue, violet), on the opposite side (Die geschichtliche Entwicklung des Farbensinnes, Leipzig 1877).

In the first half of the twentieth century, there has been a partial reversal of direction. In a phase of retreat of the evolutionary paradigm under the pressure of cultural relativism, linguistics has studied the different taxonomies, arbitrary because composed of symbols. These taxonomies are reflected from languages around the world, particularly those spoken by the people at low or archaic technology, who prefer notations of splendor and nuances favoring the graft of affective-symbolic data. In this perspective, however, although scholars have preferred to emphasize facts of verbalization, significantly, the notion of 'development' has continued to underpin the framework. It remains true that on the common background of the natural color are grafted facts of cultural diversification. Take the exemplary case of the Greek term porphureos: the width of the semantic area that it covers does not depend on a generic 'undefined' nomenclature, but on the precise technology of the purple production in the ancient world (Sassi, 1994: 281-302).

Ronga (2009: 61-67) notes that in ancient times, the discovery of natural substances to dye was closely linked to the research of medicinal plants and in general of materials with healing powers or alleged ones. For this reason pigments, that assumed an almost magical power in the people's eyes, were the subject of much superstition: still in the 17th century saffron was believed to cure the plague. It is not a surprise, then, that powder dyes and pigments were called pharmaka in Greek. The dye substances available to the Greeks were mainly four: Purpara haemastoma, old synonym for Thais (Stramonium) haemastoma, from which they obtained a kind of purple, Kerme (parasite of the oaks), madder (root of the madder or Rubia tinctorum) and saffron. From these dyes, the Greeks were able to get a range of colors that went from yellow to red to dark purple. Ronga believes, wrongly, they were not able to obtain easily shades of deeper blue or green that others got from indigo, lapis lazuli, and woad. We will see that the production of blue dates back to the Minoan and Mycenaean cultures. What was the color
lexicon in Ancient Greek? Berlin and Kay (1969: 28, 29, 30, 31-70, 71) found in Homeric Greek only four base color terms that correspond to white, black, red and yellow, having, as we shall see later, excluded the terms that come from materials. These terms are:

- **Λευκός leuκós** = white (indicates the snow, the water, the sun, metal surfaces, as an adjective also has the meaning of shiny and clear)
- **Γαλάκτιος glaκτιος** = blue-green-gray.
- **Ερυθρός erυθρός** = red (indicating also the color of blood, copper, wine or nectar)
- **Χλωρός kλωρός** = yellow (also indicates green, shades of pale yellow, the color of the sprouts, honey, sand).

In Homer the word γαλάκτιος glaκτιος is commonly used to indicate the color of the eyes, but it also describes the willow, the olive tree and the sedge (a herbaceous plant). None of these things, however, has something in common with the eyes as to the color: in fact, it originally meant shimmering, glittering, as will see later. Similarly λευκός leuκós and χλωρός kλωρός, rather than indicate actual shades, also refer to a brightness range. In the case of κυάνεος kuàneos that means dark blue, it is a metaphorical transfer since it indicates the lapis lazuli, while with regard to other terms for blue, ζωλοχρός zoλoχρός indicates mostly a violet and ὠρφνινος ορφνινος tends to gray.

Bearing in mind the contributions of Platnauer (1921), Capell (1966) and Lyons (2003), Ronga (2009: 63) examines all the Greek words that are considered more or less rigidly attributes of color, that is twenty-eight color terms:

A. **BLACK**: 1 μέλας mélas, κολοχός kolochós 2, 3 κατακορής katakorés.

B. **WHITE**: λευκός leuκós 1, 2 αργός argós, 3 λειρίως leiríos.

C. **GRAY** (shades of black and white): 1 πολιός poliós, χλωρός kλωρός 2, 3 χρώματος χρωμάτως "chormátos".

D. **YELLOW-GREEN** (includes shades of orange and brown): 1 ξανθός xανθός indicates generically yellow, 2 and 3 θύμον athon thymón pertains to fire, 4 κροκωτός krokotòs means crocus, i.e. saffron, 5 ξανθός xanθós indicates a golden blond, 6 κοιλάκιος koiλákios literally means the color of the legs of birds, 7 πράσινος prásinos literally means leek green, 8 χλωρός kλωρός sprout green, 9 ωχρός ωχρός indicates the peas and, more generally, pea green.

E. **RED**: 1 ροζός eruthròs red, 2 πορφύρινος porfúreios means purple, 3 φοινικειός phoinikeiòs literally means Phoenician, 4 and 5 οίνοψ oìnops and δαφνόρ οξίνα δαφνόρ οξίνα indicate deep red, the red shade of wine or blood, 6 μύλος mýlós means ocher, 7 χαλκός χαλκός indicates the pink flower and then pink.

F. **BLUE-VIOLET**: 1 ζωλοχρός zoλoχρός is a very dark shade of purple and 2 ὠρφνινος ορφνινος the color that you get from a mixture of black, red and white (the result is a very dark gray-violet), 3 κυάνεος kuàneos indicates the lapis lazuli and only metaphorically its color.

Ronga notes (p. 64) that the words that indicate brightness are nine (1 black, 2 white and 3 gray); nine are also the terms that indicate the shades ranging from yellow to light green; seven are the terms that indicate red; only three terms belong to the blue-violet group.

According Ronga ζωλοχρός zoλoχρός and ὠρφνινος ορφνινος refer to a color that is more purple than blue; she thinks, given the dyeing technique of the Greeks that she believes did not possess substances capable of producing the blue dye, this dark purple indicates objects or fabrics dyed with purple or madder, from which they could obtain even highly saturated shades and therefore quite dark. Therefore she proposes to move the two terms in the Red group, where there are already other shades of very deep red such as οίνοψ oìnops and δαφνόρ δαφνόρ. Regarding κυάνεος kuàneos, in this similar to κροκωτός krokotòs, both in the first place indicate a substance and secondly the color that can be obtained from the use of the pigment they are named from. For this reason, according to Ronga, Berlin and Kay (1969) would not accept either of the two terms as basic color terms.

In conclusion, according to Ronga (2009: 65) it seems that the Greeks lacked the lexical category that indicates the shades of blue and azure and, since there is a real correspondence between the words for colors and the dye substances used at the time, she speculates that the reason is due to the fact that the Greeks did not possess dye substances to get that color and even though they knew the lapis lazuli, the latter was very rare. In sum, the Greeks would not have needed to coin the terms for those shades, but they were not poor in terms of color. In fact, the lexical fields of red, yellow and purple, that is the colors the Greeks were able to produce, are rich in words to indicate that there is a correspondence between dye substances and terminology of color in Greek.

Unfortunately, Ronga’s hypothesis clashes against the evidence provided by the Minoan murals. Not only the sky-blue pigment (silicate of copper, which appears in the same shade of the Hebrew one) is used for the backgrounds, fish, monkeys, flowers etc., but it is an important element in many men’s and women's garments including those of the Prince of the Lilies, the Ladies in Blue, the Parisian, the Cupbearers, the women in the
The blue color is also part of the clothing of the Mycenaean frescoes, like the woman with the pyxis from Tiryns, the procession of women from Thebes, the Women in procession from Pylos, one of the characters on the war chariot from Tiryns, etc. In particular, women are godlesses and priestesses or wear garments with ornaments of blue cloth, blue scarves, and blue and red stoles, bodices with blue puff sleeves, skirts with blue strips. Blue, again referring to royal and / or divine personages, as in Mesopotamia and the Levant, was obtained by dyeing textiles with blue purple, within the industry of purple dye and fabrics, whose origin seems to be Minoan.

Lilian Karali-Giannakopoulos (2005: 162.63) writes that the Mycenaean and Minoan sites that have provided fragmented remains of Muricidae shells are numerous. In Crete, there are the findings of Palaikastro (1600 BC) associated with Minoan pottery and the four tablets of Knossos (Recent Minoan) with texts that refer to dyed fabrics. Fragments of Muricidae were discovered at Zakros, Koufonisi, Makrigialo, Myrtos, Pyrgos, Mallia, Tilissos, Iouktas, Kommos and Chania. Other evidence comes from Akrotiri (Santorini) (ca. 1500 BC), from Cythera (ca. 1650 BC) and from settlements located on the coast of the Peloponnese and Asia Minor. At Makrygialo, always during the seventeenth century B.C., some fragments of Hexaplex trunculus were found, while at Iouktas and Tilissos the three species used to get the purple dye (Bolinus brandaris, Hexaplex trunculus and Thais haemastoma) are represented; at Myrtos and Pyrgos appear the mollusks Hexaplex trunculus and Thais haemastoma. The most important site of Kommos (Recent Minoan, 15th century B.C.) had 400 specimens of Hexaplex trunculus, Bolinus brandaris and Thais haemastoma.

In Chania, a recent excavation of the Greek-Swedish Mission has identified the joint use of the species Bolinus and Hexaplex. In addition, these same species have been found later under the floor of the Recent Minoan period I. From Kastri, Kythira, come several species of mollusks, among them the Muricidae are represented by a considerable amount of remains, found in layers both contemporary and subsequent to the Minoan occupation. Asiné, a site in Argolis, has provided 224 pieces of Hexaplex trunculus (Middle Helladic III), but the funerary context of the discovery does not allow to establish local production activities. Finds of Muricidae shells are reported in Aegina (1650-1600 BC) and Agios Kosmas, Attica (Recent Helladic, about 1500 BC). Examples from Troy VI are dated 1425 BC. More evidence comes from Minato el Biella in Ugarit (1500-1400 BC) and Hala Sultan, Cyprus (Recent Cyprus,1200-1190 BC).

### Blue, glass and faience

In Linear B, the Mycenaean writing, the word for blue is *kwa-no* from which the Greek κύανος κύανος derives. According to Bernabé & Luján (2008) it refers to the imitation of lapis lazuli or a more cheaply Phoenician imitation made with a vitreous blue paste. Chadwick & Ventris (1973) translate 'glass inlaid with lapis lazuli' and Shelmerdine (2008) translates 'blue glass'. Given the rarity of lapis lazuli in the Aegean world, with the exception of seals, and the ubiquity of 'Egyptian blue' glass, ingots of which have been found in the wrecked ship at Uluburun, *kwa-no* in general should refer to Egyptian blue glass. Also Palaima (1991: 283) refers to the term *kua-no* to the blue glass paste.

The Egyptian Blue, also known to us as Pompeian blue, is a synthetic inorganic pigment, known to the Egyptians, Etruscans, Greeks and Romans and also used in the Middle Ages and the Renaissance. The azurite is instead a natural and inorganic pigment known in Egypt since the Fourth Dynasty, and in many ancient civilizations. In Europe it was the main blue pigment between the fifteenth and seventeenth centuries A.D. It is a basic copper carbonate, varying from ultramarine blue to greenish blue, due to the presence of malachite and chrysocolla with which it is always associated in the copper mines and / or because of the progressive alteration; in the presence of chlorides it can turn into paratacamite, also green. It forms monoclinic crystals. The azurite is a fairly common mineral and its production is relatively simple: the mineral is reduced to powder, which is then washed and sifted, but obtaining the right degree of grinding has always been a big problem that has been solved by means of sometimes very ingenious systems. The grinding of the ore in fact strongly affects the final color of the pigment, which can range from dark blue (coarse powder) to dull blue (fine powder). It is soluble in acids.

In Egypt, blue (*iryn*) was the color of the sky and represented the universe, but it was also the color of water in general and the Nile in particular, and the waters of the primeval chaos known as Nun. For this the blue color was associated with fertility, rebirth and the power of creation: glass or glazed blue ceramic hips were a popular symbol of the Nile. The creator god Amun was often represented with his face blue, as well as the Pharaohs associated to him as divine incarnations. In painting, the Egyptians manufactured blue pigments from various minerals including azurite (*tefer*) and copper (*bia*), but the finest and most famous pigment was the...
'Egyptian blue' (irtys) which was obtained by boiling quartz with copper under the form of malachite, calcium carbonate and natron. Natron (sodium carbonate hydrate) derives its name from the Egyptian word for salt "nfr", which means pure, divine, an adjective deriving from "Nfr", which means god. The symbol of sodium (Na) is derived from its Latin name natrium, derived from the Greek nitron, which in turn was derived from the Egyptian term. The process was expensive and difficult to do, but it produced a beautiful, very popular deep blue. The Egyptian blue is the oldest known artificial pigment, appeared about 2500 B.C. in a tomb fresco dated to the reign of Ka-sen, the last king of the First Dynasty in Egypt. When the Egyptian blue is irradiated by visible light it emits near-infrared rays with exceptional strength, with every particle of pigment discernible a few feet away (Choi 2013). The Egyptian blue was known to the Romans as caeruleus, from the Latin caelum, sky (cf. English cerulean, sky blue). Therefore, we can detect also in the Mycenaean term kn-ua-no the sense of a deep blue that has in it the brilliance of glass or glazed faience. For this reason, the textiles of that color, similar to that of the royal robes and vestments of Mesopotamia and the Levant, was fit to clothes and robes worn by both royal and divine personages represented in Minoan and Mycenaean frescoes. It is the blue known as Egyptian blue, which is also used in similar contexts and was known since the Bronze Age. How much of this meaning was transferred to Homer's khâmeus (about 8th century B.C.), and in general to the Greek word khâmeos is not clear, but I think that neglecting the union of transparency, hue and brightness in the Greek blue and saying that the Greeks lacked a term for blue actually means neglecting an important cultural-linguistic aspect. The first glass produced in the world comes from Mesopotamia and dates the twenty-third century B.C.; in the sixteenth century B.C. in the same area the first glass vessels appear, but the first evidence of melting glass from raw materials was discovered in the Egyptian site of Qantir in the thirteenth century B.C. Chemical analyses conducted by Henderson et al. (2010: 1-24) showed differences in composition between the Mesopotamian and Egyptian glass and, through the use of isotopes of neodymium and strontium on samples of glass from the fifteenth to the eleventh century B.C., these scholars have shown that probably there was an independent primary production both in Egypt and Mesopotamia in the fourteenth century B.C. and that both these areas were exporting to the palatial societies of Late Bronze Age Greece. Glass technology emerged from metallurgical and ceramic production, but in contrast to these materials, the manufacture of glass represents a fundamental transformation of raw materials (ground quartz or sand, vegetable ashes and dyes) in a very different material, the first true synthetic material. There are also very detailed broad descriptions of the manufacture of glass in the cuneiform texts from the seventeenth to the fourteenth century B.C. and possibly even earlier, a fact that does not occur for other technologies. Henderson et al. (2010: 2) suggest that the color produced in glass, in imitation of semi-precious stones, had a strong social and ritual meaning. Possibly color was the primary impetus for the production of this material in the Late Bronze Age societies. It is believed that the Hurrians, an innovative people that controlled the state of Mitanni and predominated among the Hittites and in Kizzuwatna (south-western Anatolia), produced the first glass vessels and, of course, the ovens suitable to contain them. Until that time, glass was only used to produce beads. The high ritual, social and political value of glass, much of which was produced under royal patronage in Mesopotamia within the activities of the palaces, led to an increase in demand and trade in the Mediterranean and, by the mid-second millennium B.C. glass was used by the Late Bronze Age highly hierarchical societies in three main areas: Mesopotamia, Egypt and Greece. The excavations at the site of a shipwreck dated the beginning of the thirteenth century B.C. at Uluburun off the Turkish coast has shown that the commercial cargo probably traveling from east to west, was made up of cobalt blue, manganese violet and copper-rich turquoise glass ingots. Technology transfer probably occurred between Mesopotamia and Greece via Crete, which led to the production of specialized glazed pendants with intricate decorations that became the trademark of the Mycenaean glass industry. Nikita and Henderson (2006) argue that, during the Mycenaean palatial period at its maximum splendid expansion, in the Aegean, Crete and Cyprus there was a thriving glass industry, which was different from that in the Middle East and Mediterranean for the exclusive manufacture of vitreous jewelry and ornaments, such as vitreous hilts of swords, whose favorite colors were dark blue and translucent turquoise and references in the Linear B tablets support these scholars' hypothesis. Majolica (from Majorca, Spain, one of the most active centers in the Middle Ages) is a type of pottery characterized by a porous ceramic body, covered mainly through immersion of a tin glaze (or at least lead). Abroad, however, it is often known as "faience", from Faenza, Italy. In a narrow specialized sense "majolica" is just that with a tin enamel. In a broad sense, even in the dictionaries, it is considered majolica all glazed earthenware, more properly to be understood as any object in majolica biscuit coated with white enamel,
decorated and annealed with or without crystalline glazes. Since prehistoric times, the clay mixed with water and dried in the sun was used to make containers, especially useful to contain water. The use of the cooking in a hearth allowed the discovery of terracotta, which is more durable, but had the disadvantage of being porous and let exude liquids. The Egyptians were the first to discover the highly effective technique of glazing, still in use today, exporting it to the other peoples of the Mediterranean and then to the whole world. In the Greek world the term ceramic (from ἱερακός, kéramos, which means clay, potter’s clay) was born and from it a very fine type of production spread abroad, different however from the siliceous glazing of the Egyptians.

On the other hand, Karen Polinger (2008: 179-182), speaking of Minoan unglazed ceramic of the faience type, assumes that the Northwest building at Knossos and the South Wing at Zakros are to be considered sites for the production of faience, and therefore that potters worked closely with the artisans working ivory, glass, gold, crystal and so on. At Amarna the shops of potters, sculptors, jewelers and craftsmen who produced faience and glass occupied the same area. What is common to these artisans? It is obvious that they worked translucent or bright materials, and that, within archaic taxonomies, they were to be considered similar. Polinger believes that in Minoan Crete, as well as in Mesopotamia and Egypt, faience had multiple meanings of brightness, brilliance, fertility, divinity, and even magical appearance, the latter quality particularly suited to object associated with the ritual and epiphany, the center of Minoan religion. Similarly, over a hundred obsidian blades were chipped in a small space near the Throne Room at Knossos: some were used to cut something, and then almost all of them were buried under a new floor.

In the Egyptian language the adjective derived from ḫebnet, a term that indicated faience, was used for the deities and often for the pharaohs of the eighteenth dynasty, as an epithet for ‘brilliance’: it meant 'glittering of mystic events, bright, imbued with celestial light'. Its luminous blue-green was associated with youth, vigor, joy, fertility, and especially to the goddess Hathor, ‘Mistress of Turquoise, Mistress of Faience’, whose solar connections promoted the revival of the dead through the ushabti and other funerary items. The statuettes called ushabti (originally also called shanabti or shabi), which in Egyptian means 'those who answer,' were part of the grave goods. They could be made of precious materials such as lapis lazuli and other stones, but also of the most common materials such as wood, turquoise or blue faience. In the temples the shrine of inlaid faience evoked the creative power of the triumphant sun over the chaos of darkness and signaled the presence of God. The earliest examples date back to the fifth dynasty, with faience tiles decorated in gold leaf and later texts put together faience with gold, as if they were complementary aspects of moonlight and solar light. During the eighteenth dynasty faience inlays were part of a wider system of color symbolism that connected the temple and the gods' images to metal and lithic worlds.

Finally, Polinger remarks, the same process of manufacture of faience seems to have given more depth to its magical aura: in fact, it gave birth to faience amulets, which entered the kiln almost colorless and came out of sparkling colored. A similar association between esoteric technical procedures, miraculous and vitreous ceramic replicas of the natural processes that produced minerals, metals and other substances, and divine mythologies, is also visible in the Babylonian and Assyrian cultures. The Assyrian and Babylonian gods often shone and sparkled and certain stones were often associated with particular deities, and perhaps to their human counterparts, and to medico-magical properties. Moreover, adds Polinger (2008: 181-182), color and light played a key role in the Bronze Age and later Mediterranean thinking, but they are beginning to be studied only recently. For example, Mycenaean tin objects covered with gold and silver connected them with the divine and the people who used them obtained extraordinary power and status. In the Minoan palatial architectural contexts and in particular at Knossos, it seems that certain forms of gypsum, a very soft mineral made of calcium sulfate dehydrate, were deliberately chosen for their color and reflective qualities. Many Minoan sites, from palaces to the tombs of the Mesara type, were designed in order to get astronomical alignments with the dawn, and other aspects of directionality, of which particularly impressive are the alignments with the solar solstice and the equinox in the Throne Room at Knossos. Minoan artists have not only tried to show the activity generated from a divine epiphany, but also the altered states of consciousness resulting from fast, execution of repetitive actions, and taking drugs. Reconsidering the chryselephantine (gold and ivory) statues of the classical world, often decorated with inlays of colored stones or colored glass, you can see how the Greeks tried to re-create the epiphany of the deity and therefore how strong was the relationship between color, perception and the divine among the Greeks (Morris 2004; Polinger 2008: 182).

Chloë N. Duckworth (2012: 309-327), in turn, speaking of the introduction and use of glass in Late Bronze Age Egypt, i.e. during the eighteenth and nineteenth dynasties, says that the artificiality of this material was
deliberately proclaimed, highlighting the ability of those who produced it to access the processes of creation and transformation. The color was of paramount importance in this ideology and this researcher suggests that glass was prized for its ability to take on colors in depth, instead of showing them only on the surface as it occurs in painted, glazed or gilded objects.

Andrea Sinclair (2012: 118-149) notes that Late Bronze Age glass technology reached its creative peak, and so the range of colors produced for the faience expanded dramatically. Cobalt blue was used to produce shades from vivid blue to violet and gray, antimony yellow obtained from a basic lead antimonate (with various shades ranging from lemon, orange, greenish, pinkish, today also known as Naples yellow) was introduced to produce a yellow and matt green, pure white was obtained from quartz and subtle shades of pink, purple and gray appeared in the color palette. Faience items were improved and hardened with the introduction of glass and frit (called in French "fritte ", in English" frit ", in German" fritte ", it is a first calcination of the mixture of melting silica due to become glass).

As Sinclair notes rightly, the technology of glass in this period reflects the same monopoly by the elite seen in the past for metallurgy, and in the areas of the Levant, the Near East and the Aegean archeology shows that glass production occurred in direct relation with the palatial elite and the temple sites. The technologies of glass and in particular the use of cobalt mineral, were elitist technologies physically and metaphorically associated with royal prerogatives and worship. The Hittite word ẖakku (wa)-nnu / nakkanna (n) designated a variety of blue materials, including beads, ornaments, precious stones and copper; this term was related to the Ugaritic word qiqi, Akkadian uqnu and Sumerian Z.A.GIN. All three were nouns originated from a Mesopotamian word for lapis lazuli, and were equally applied to synthetic materials, for example the Akkadian ‘ŋṣaṭu Kuri’, Sumer ‘Z.A.GIN. GIR4’, i.e. lapis lazuli of the kiln. The fact that they were a suitable substitute to gemstones for their sparkling clarity did not reduced their value as they were synthetic materials and therefore faience, glass and frits together with precious stones contributed to the construction of the Late Bronze Age elite identity.

**Color in Mesopotamia**

For this part I am referring in particular to Sinclair (2012a: 5-13 and 2012b: 118-149) for a brief excursus on colors in Mesopotamia. Please, note that the Sumerian terms are capitalized and the Akkadian ones are in italics. The Sumerian word B-ABBAR is or the Akkadian one pesu are equivalent to White and describe the concepts of light, brilliance, radiance, holiness, ritual purity and sometimes the lack of color. It was an auspicious color the name of the sun god Utu / Šamaš, the noun for ‘day’; it derived from a notion of brilliance. The ideogram used had evolved from an earlier representation of the rising sun; in addition white was matched symbolically to the precious metals silver and antimony, and was applied as an epithet to the moon god Nanna / Sin and the planet Venus / goddess Inanna and then to the splendor, in particular that associated with celestial bodies. Black was called GE6 in Sumerian and salmu in Akkadian, and included darkness and dark hues, from dark gray to dark blue through true black. It was considered a negative color, associated with the night, darkness and shadow. It was used to refer to the Goddess of Darkness, demon deity of the Hurrian otherworld in the second millennium B.C.; scholars consider her an adoption of the northern Mesopotamian demon Lamastu. Obviously the character, when doubled (keskku, darkness) was one of many terms that denoted the realm of the dead, and therefore as an abstract concept covering all shades of darkness, misery, shadow, but as a color it was not avoided in visual representation, but it was an important component of it.

The Sumerian SÚ4 or Akkadian samu was roughly equivalent to red, tacking heavily toward dark red and brown; it was a favorable color which shielded against the evil forces. Red was specifically associated with the physical representation of the deity, as evidenced by the epithet of Inanna / Ishtar of ’Red Lady of Heaven’, a title that reflects her being both the morning star and the evening star, the planet Venus, but red also defined the planet Mars, which was called the Red Planet. The Sumerian SÚ4 or Akkadian samu are also used to describe the color of the sky at sunrise and sunset, and also associated with ideas of brilliance and splendor. The carnelian or cornelian, a well-known variety of chalcedony, a semi-precious stone widely used in jewelry, had this name; intensification of adjectives such as bright and dark were used to define shades of red. Terms derived from nouns, such as blood (damu) that involve ideas of brightness, darkness, passion and warmth, were related to the red color, for example, HUS or busu, a derivative term which means bright red and was used in contexts of blood and fire, copper, storm, battle, and wrath. The goddess Inanna / Ishtar, who also had the epithet of ‘She with a Red Face’, not only reflected her aspect of the goddess of the planet Venus, but also her role as a patron of the battle and the warriors. Hence the red color also included the idea of the aggressive and destructive nature of the goddess.
The Sumerian \textit{SIG7} or the Akkadian \textit{warpu} involved the range from yellow to green, and was considered a favorable color, used to evoke ideas of freshness, fertility and maturity. It described plants, ripe fruit, trees and, at times, was also used for the sky. This use has sparked discussions among scholars if one had to extend the range to include the blue color, maybe the light blue. The word for green worked as a simile to describe bright, shining or luminous things, partly because the term \textit{warpu} originally served as a word for a plant or vegetation. As white was associated with silver, so green-yellow was associated to gold, but was less common and primarily it looks more like real yellow than green in the artistic use. It is interesting to observe that the yellow paint was often used specifically for the forces of chaos, such as lions, demons and hybrid monsters.

The blue color as a separate entity was expressed using the term for the lapis lazuli \textit{ZA.GÌN / uqnu} and, like green, it was considered a favorable color and associated to symbols of opulence and regal as well as divine holiness. \textit{uqnu} was used to describe dark blue, dark purple and even black materials, but with associated notions of brilliance and splendor, reflecting the value of lapis lazuli in the ancient Near East because of its rarity and attractive luster, augmented by small traces of silvery pyrite and white calcite in the dark blue matrix, which gives the material a glittering quality perhaps connected to the night sky. Because of these qualities, the stone was a royal prerogative since the power to obtain and distribute it belonged to the sovereign, but it was not the blue color alone that was important, as its use in a harmonious composition of colors, an idea which is reflected in the next term of color.

The Sumerian \textit{DIR} or the Akkadian \textit{burrumu}, multicolored, was a concept of color separate and unto itself, rather than a color that expressed the idea of varied, designed, decorated, in a manner similar to terms from other cultures such as the ancient Greek \textit{poikilos / ποικιλος} and the pharaonic Egyptian \textit{seb / S3B}. \textit{burrumu} was associated with notions of dappling, decoration and intricacy, and in this sense it was an epithet of the goddess Inanna / Ishtar, but was also confused with red, and it was written with the ideogram representing the bull's horn. A meaning of the term was also given by its use to describe the stains on animal skins or embroidered fabrics and this helps explain the preference of the Mesopotamian peoples for variegated stones such as agate, jasper and chalcedony for luxury jewelry.

The use of decorations with white, red and blue was very common in the representative art of Mesopotamia and probably it reinforced the idea of the need for balance between the three cosmic elements, the heavens of the gods, the earth and the world of men, the underworld of the dead. In addition to this combination of three colors, the dominant combination matched red with blue or black. It was a symbolic dichotomy of the basic dualities, male force balanced by the female one, heaven and earth and the sphere of the divine and the human. Red and blue were a metaphor for the divine couple of the goddess Inanna / Ishtar and the shepherd god Dumuzi / Tammuz, where the female is the red and the male the blue. Perhaps it also reflected the androgynous nature of the goddess of love and war, since her red figure was traditionally represented adorned with jewels of lapis lazuli. The combination of red and blue with the divine sphere is also illustrated by a text describing the heavens, of which the highest, belonging to the sky god An / Anu was composed of red carnelian, while the throne of the god was made of lapis lazuli and red amber.

In addition to the visual configuration, that is the combination of red / blue and the combination of red, blue and white, it seems that the quality of light and brilliance was of the utmost importance in Mesopotamian thought. In fact, terms of brilliance or splendor are common to describe valuables such as jewelry, weapons and cult statues, and they also tend to work in similes for purity and holiness. Of course, these terms are often derived from cuneiform signs for sunlight and therefore the color white \textit{UD / pesu}. Terms for dark colors such as \textit{adaru} and \textit{damu} counterbalance them; these terms, while representing destructive and negative influences, nonetheless are essential elements for a balanced and harmonious pattern. There is the idea of an orderly universe in which malignant influences are kept under control by the light, which is reflected in the common representation of the king who shows his control over the forces of chaos, a very important motif of royal iconography of the ancient Near East.

That is why blue and white glass eye amulets against the evil eye and lucky charms are common still today. Brightness and darkness do not automatically correspond to bright as opposite to dull, and in fact lapis lazuli, as well as other dark stones, were polished to make them gleaming. Sinclair believes that, while the languages of Mesopotamia were limited in the vocabulary of color, this vocabulary was materially rich and meaningful, with an emphasis on the concepts of brightness and brilliance equated with notions of spirituality, and the color schemes that expressed ideas of harmony and cosmic order. Certain colors, then, had important symbolic associations, such as red for the gods, green for the abundance and blue for power and sovereign opulence sanctified by the gods. In addition to the basic terms (which, however, lacked for yellow, linked to green and
blue, according to the scheme by Berlin & Kay), the Mesopotamians used comparative descriptions to express not only colors, but mostly adjectives of intensification, in particular regarding shades of red, with terms for the
deep red, dark red, burnt red, bright red, and with two degrees of dullness.

The precious stones were rarely named for their color except carnelian, a variety of chalcedony whose most prized color is a red-orange variety, and lapis lazuli describing blue, dark blue and black. The texts that speak of blue wool commonly use the Sumerian prefix ZA.GIN (lapis lazuli) to describe different shades of color yarns and fabrics. In the decoration of jewelry dominated black bitumen, white limestone, shell or ivory, red from carnelian and blue from lapis lazuli, juxtaposed in gold, silver or electrum matrices. Electrum is an alloy of gold and silver which can be obtained artificially but which also occurs in nature, especially in Asia Minor, and one of the first materials used for the production of coins in the eastern Mediterranean. Electrum was also used for the production of tableware as it was believed to have the property to eliminate poisons from everything with which it was in contact. The name comes from its amber color.

The colors of the Egyptians
I will also use Andrea Sinclair (2012: 118-149) for a brief description of the colors of the Egyptians, who have five basic terms (according to Berlin & Kay’s terminology), testified since the third millennium B.C.. They are: 
bd white, km black, dr red, w3d green / grue (green-blue), s3b polychrome. The Egyptians had no other words for shades but used descriptive and comparative terms in addition to the basic terms, such as the description of the color of the sky as lapis lazuli, hsb3d or turquoise, mfk3t. The linguistic terms, however, do not express the whole palette of colors actually in use, and so, while lacking basic terms for blue and yellow, these colors appear in the broader context of comparative terminology for objects, materials and livestock. The advent of a wider range of pigments in the New Kingdom did not expand the lexical vocabulary, and w3d would encompass all possible variations of blue-green, including violet and indigo according to Egyptologists. Many scholars think that the Egyptians were more interested in intensity and contrast than to a specific hue or shade, and so 'red' would include all the range of the 'hot' shades, from red-brown to red, orange and yellow; while green would include the 'cold' color range, from aquamarine green and the different blue, purple and indigo shades.

In fact, the Egyptian color lexicon does not seem to be so directly associated with the hue as with the tonal qualities, and iconography seems less interested in naturalistic realism and more in the importance of the readability of meaning, with a formulaic and clearly structured application of the color as a visual idiom to indicate the specific class and value of an object.

The foundation of the Egyptian state brought with it also the adherence to a strict visual repertoire that functioned as a means to express state ideology to reinforce the value of the unity through the balance of opposing forces, order, Maat, chaos, masculine and feminine, earth and sky, and fertility, represented by the Nile Basin against the sterility of the desert. The colors were working together to reinforce the hardcoded messages of the images on the unity of opposites: this duality was expressed by the use of different skin color, that is dark red-brown for human males, and yellow-ocher, white or pink for females. The symbols of the unification of Egypt were the white crown of Upper Egypt and the red one of Lower Egypt combined into a composite crown that meant the order of the universe.

The fertile land of the Nile was the Black Land and the desert was the Red Land. Black had meanings of fertility, regeneration and night and the god of the dead Osiris was the Black God. The yellow-red shade had divergent semantic values, as it represented both the beneficial solar forces and the evil typhonic ones. It could be used for fertility figures but it was also the color of the lion goddess Sekhmet in her solar aspects of both nurturing and destructive deity. For this reason, red-yellow, with its negative connotations, was used in a limited way in the hieroglyphs. Deities, in particular in the descriptive statues, were supposed to have bones of silver, flesh and hair of lapis lazuli.

Isolated, colors could bring different messages: white was a symbol of purity, sanctity, silver and the moon; green was used for malachite and ideas of fertility and regeneration, since the term green / grue (green-blue) w3d was related to terms indicating freshness and the stem of the papyrus. Gods of fertility such as Osiris and Min could have green flesh in visual representations, but others such as Amen-Ra, the gods of the Nile and the goddess Hathor had blue flesh. The Mediterranean Sea was the Big Green, w3d-wr.

The association of fertility and regeneration with green is extended to blue, which tends not to be differentiated, since the objects of glazed faience and turquoise were considered suitable to the blue-skinned goddess Hathor. In the Egyptian language of color, however, lapis lazuli, hsb3d, seems to be the term applied to blue or dark blue materials different from the green ones. However, there is no doubt that blue is present in the Egyptian color.
palette: in fact, the blue color became the most prestigious one, visually associated with luxury, status and elite. Indeed, in the New Kingdom the blue color jumped quantitatively on the visual plan, a thing that will not be repeated until the Ptolemaic Period. With the use of cobalt pigments, it passed from a conceptual and material unity to two entities made of the deep dark blue of lapis lazuli and the pale blue of turquoise. In the late eighteenth dynasty the deep blue shades were widely used to decorate objects of alabaster, ceramics and glass, replacing the previous predominant use of iron red and manganese black. The combination of light blue turquoise, dark blue lapis lazuli and cobalt, and red ores was the most frequent for jewelry, weapons, furniture and faience, and held a specific semantic value.

The Origin of Color Terms in the Neolithic and Bronze Age

David Warburton (2008: 216), an Egyptologist, specialist in archeology of the Near East and a member of the Excellence Cluster Topoi for the study of ancient cultures, argues that the precious minerals, such as lapis lazuli, served both in the terminology of color and in its development, against those who argue that the terminology of color is simply a matter of gradual development of abstract terms that appeared spontaneously and independently in different languages. This scholar states that the Bronze Age in particular may shed light on the understanding of the emergence of color terms in terms of materials and trade. The incorporation of the materials of the Bronze Age in color theory would recognize that the precious materials were crucial to the development of terms of color and also that the lexical borrowings were more decisive for the dissemination of words that indicate color and the division of the spectrum than simple psycho-physical evolution.

According to Warburton (2008: 223-24) the origin of the Egyptian word ḫḥd and the Akkadian term warqu to say green is the same and dates back to the Neolithic, from an original word that was derived from a word related to ‘green’, which indicated green jade and prestige objects made of this material, such as the jadeite (and other green stones) axes, symbol of the European Neolithic or the green beads and axes ubiquitous in the Neolithic Near East. The Akkadian term for gold, bālārum, is connected with the Greek krounos and related terms include a Syriac word meaning gold yellow. The Mycenaean Linear B ke-ro-so is also a color term for gold and Danish modern words for gold and yellow are extremely similar, gul and guld. So the German gelb and the English yellow and gold derived from the same proto-Indo-European etymology *gelhu which means ‘to shine’. The essential radicals of these words are the same: g / k / h and r / l and, according to Warburton, it is possible that these words are related to a common original term dating back to the Neolithic and that they refer to the same material and the same color. Gold appeared in archaeological finds two millennia before lapis lazuli, since we have a Balkan necropolis, Varna in Bulgaria, definitely dated to the third quarter of the fifth millennium. Gold then makes its entry into Central Asia in the fourth millennium before appearing in abundance in Giza, Ur, Troy and the Greek Cyclades in the third millennium.

Warburton (2008: 238) writes that the Egyptians possessed approximately eight terms of color, including at least five associated with precious materials and that these materials are at the origin of the terms of color. Although the two terms for black (kmm) and darkness (kk.w) are not related to precious materials, this author argues that there is only one word for light or bright, ḫl, which comes from the word for silver and occasionally means white. Green (w3ḥd) stemmed from a stone, perhaps imported jade, red (dir) was a Neolithic word of African origin with no ties to materials. Yellow was gold ( nb.w), dark blue was lapis lazuli (ḥsbdj), and light blue came from turquoise (mjk.lḥ). In essence, in the second millennium B.C. the Egyptians were using words like gold, lapis lazuli and turquoise as color terms, related to precious materials and only later the term for lapis lazuli, both in Egyptian and Akkadian, became a real abstract color term, such as the Italian azzurro, which derives from the Persian word lazward, lapis lazuli.

The concept of color (2008:240) was then related to precious materials and developed in the palaces and temples where these materials were kept and used and, as a prerogative of the elite, did not necessarily filtered down even to the scribes and scholars. Therefore, they were not part of the colloquial language. According to this scholar, the emergence of real abstract terms of color such as azzurro, required a much longer period of gestation, with trade items as well as lexical exchange (for example, the Greek kromos, blue, comes from the Akkadian term nāru for lapis lazuli) on a much wider scale before the basic terms might appear. According to Warburton (2008: 242-43), terminology color neither is taken from the natural world nor derives from 'brilliance' nor from pigments, but from precious materials, i.e., silver, lapis lazuli, turquoise and gold, plus amethyst, chalcedony, carnelian and w3ḥd, he believes to be a type of green stone like jade. One has to remark, however, that Warburton does not consider that these materials were valuable both because they are inherently glossy, shiny, bright and because they
are symbolically brilliant as a manifestation of the sacred, because the halo of light or the flaming or radiant head are ancient symbols of divine epiphany.

Warburton (2008:247) believes that the Berlin & Kay's paradigm is fundamentally wrong, because it puts at the first step the combination of black / white. In fact from the ethnographic data it might be in reality the combination of light / dark. Moreover, the terms for white and black are extremely diverse in the Indo-European and Semitic languages, while in all the languages of which we have ancient written documentation, i.e. Egyptian, Akkadian, Chinese, Greek and Japanese, it is 'red' which is present from the beginning. In fact, he writes, the first color to be named may have been 'red' and even since Paleolithic times, as witnessed by the very early use of red ocher. The second color to appear might be 'green', but it could appear only in the Neolithic, while red may have appeared in any of the previous millennia. According to Warburton it is only at this stage that the terms for 'white' and 'black' become significant and this explains the great variety of basic terms for 'white' and 'black', which are not related in several languages to an extent comparable to that of the reds and greens.

However, says this scholar, the revolutionary step that allowed all the subsequent changes, took place with the green color, because it was based on a precious stone, jade (and other similar green stones, I might add), which set the pattern for later additions in the form of gold, lapis lazuli, carnelian and turquoise. Warburton (2007: 241) notes that the interaction between the Aegean world and the Near East is increasingly recognized, coming out of the isolated bubbles of the archaeological departments organized according to geographical area criteria. Moreover, since the beginning of the second millennium B.C., the Indus civilization was in contact with Mesopotamia and the latter with the Aegean area: the spheres of interaction included almost all the entire civilized world, and then the movement of precious stones, their names and colors.

As stated by Warburton (2008: 250-55), the concept of color did not come out from the palaces and temples during the Bronze Age, and it was not until the Iron Age, which became widespread and was then possible to translate it by inventing new words. However, as it has already been pointed out, in some languages, some of the old words, such as red and blue, representing the descendents of the original names for precious materials and, in addition, almost two millennia separate the appearance of the classic Greek word _kuanos_ from orange. However, it is worth noting, writes this scholar, that the contribution of the palaces and temples to the color vocabulary is extraordinary, given the circumstances, because the elite of that time were struggling for the creation of a concept that until then had been unknown. In contrast, the fast diffusion of the color word 'orange', the fruit name 'orange' and _burtuqali_ (Arabic for orange from Portugal, as the Portuguese sailors were buying oranges against scurvy, an adjective that can be found in modern Greek) confirms that the concept of abstract color had become commonplace.

The origin of this phenomenon occurred about a thousand years before, around the beginning of our era, when the scribes began to imagine terms for colors, and this explains the disappearance of _bd_ from the Egyptian Coptic, derived from the ancient Egyptian like the modern Greek from the ancient one, because the word _bd_ probably was not a basic term for white, but it meant 'silver' and was interpreted as clear or bright and therefore the word declined and was replaced. At first, however, the known colors were those of which we have spoken, and, most interestingly, in most ancient written languages, as in Egyptian, Akkadian and ancient Greek, there were several terms for blue and red. So certain divisions of the spectrum were removed and most of the languages focused on the hue, as shown in the paradigm by Berlin & Kay, absorbing the different types of blue and red into a single category of blue and red, a clearly modern uniformity. Some languages, however, keep traces of the passage of this color value, such as the Coptic with two reds, the classic Greek with several reds and still survives in Russian with two blues and Mandarin Chinese with two greens as basic color terms. In more modern times, in sum, there was a lexical consolidation with the loss of multiple reds and blues, and at the same time an extension of the lexicon of basic color terms to pink, orange and so on. But that language development was not linear. Warburton says that the color lexicon evolved at most only during the latest six thousand years, and saw a temporary inflation of reds and blues in the urban civilizations of the last millennia B.C. and the first millennium A.D., before the hues consolidated into individual terms and added new shades.

The terminology of color, says Warburton, is a recent phenomenon as it is evident from the questions that have occupied scholars on the subject of green and blue, which are used by at least five thousand years, but seem to exist only as abstract terms from the European Middle Ages, although they actually exist from the first millennium B.C. in China. The fundamental contribution of the Bronze Age was to provide the stimulus, in the form of precious materials and language exchanges and trade, to the slow and painful development of the human mind. It was not until the first millennium A.D. that aspects of the landscape began to appear in terms...
of color, for example, the sky turned blue in Coptic (and not 'similar to bronze, to iron, to lapis lazuli, turquoise', etc. in other languages), and only in the second millennium A.D. blue and orange began to appear as abstract terms. The value of the materials in the Bronze Age played a role in attracting attention, but the transformation of terms indicating materials in terms of color took place not in the trading centers, but inside the palaces and temples of Egypt and Mesopotamia and, in Egypt, it seems that only the upper layers of the elite began to play with associations which later led to abstract terminology. So probably writing played an important role in maintaining the terms and allowing their development during the passage of generations. From precious materials, furthermore, the chromatic terms passed to the art of dyeing. It is interesting to note that the consolidation of color lexicon still in the Middle Ages was in some respects problematic: it is the case of turquoise, which is included in the sphere of blue in French and in that of green in German. However, Warburton notes (2008: 252), the development of the terminology of color has not only meant the consolidation of chromatic basic terms, that is abstract words, and the acquisition of new shades defined with basic terms, but also a lexical loss, namely that of the words that defined subtle color shades of blue and especially those in the red part of the spectrum in Akkadian, Mycenaean, Classical Greek and Egyptian.

The color of the sky and the adjective caeruleus
Warburton (2008: 240-41) points out that Modern Greek uses the word galazios and not kuanos to say blue, suggesting a fundamental break that took place between classical antiquity and the Middle Ages, when the nature of the color alters fundamentally and affects especially the blue color. The words that originated during the Bronze Age and that classical antiquity largely inherited were not abstract salient terms and it is interesting that the only memory of lapis lazuli from the Bronze Age remains in the neo-Latin basic color terms azurro, azul, azur, which are derived from Persian and that are much more recent than the Ancient Greek kuanos. Although the sky is always visible to everyone, the concept of a 'color of the sky' is fairly recent, says Warburton. It has appeared in historical times, that is, since the Iron Age. In the early Egyptian texts we read, for example, jwn n nb.w that is 'the color of gold', or jwn n lsbd, that is 'the color of lapis lazuli'; only in the last stages of the Ancient Egyptian language the sky begins to have a color, borrowed from the color terms for lapis lazuli and turquoise, but the 'color of the sky' is unknown until Coptic, the final stage of the Egyptian language. In a similar way the famous second-millennium-B.C. sun chariot in Denmark included a golden sun disk, which shows the close relationship between the sun and gold and also the yellow color of the sun. Warburton believes that gold, as a metal, is at the origin of the Proto-Indo-European word *ghel- that gives rise to most of the words for yellow / blue / green in the daughter languages, and that the meaning of 'shine' is extracted through the metal and not vice versa, an abstraction that the Bronze Age mind was not yet able to accomplish. Theodosiou et al. (2011: 24), speaking of the sky in the Iliad and the Odyssey, seem to confirm Warburton’s hypothesis. The Homeric sky formed a hemispherical dome which covered the flat earth exactly, resting on columns (Odyssey XI, 17, I, 53-54) or a giant's shoulders (Thesprotia (1988: 517) and was made either of iron or copper. In particular, for Homer, writing in the eighth century B.C., the sky was made of copper (Iliad V, 504 and XVII, 424-425), or much copper (polychalkos, Iliad II 458, V 504, 364 XVI, XIX 351 Odyssey III, 2). There are also references to an iron sky in the Odyssey (XV 329), but it is unclear whether the effect is only metaphorical. The sky, therefore, though unreachable, was solid, but it was not a sterile dome metal, because it was full of life, that of the stars and constellations. The gods lived there, but they were below it, on the highest peaks of the mountains, and in particular those of Mount Olympus. On this metal dome Helios, the sun god, traveled with his chariot during the day, while at night he traveled around Hades in a golden bowl. In the myths the sky was represented by Ouranos (from oros, mountain and nos, above, on top of mountains), ruler of the first generation of cosmogonic forces. As noted by Bakker (2010: 224-25), the Mycenaean word di-pu, bowl, is closely linked to the Luwian hieroglyphic _tphz_ (phonetic / dibaz - /) (Luwian is an Indo-European language belonging to the Luwian branch of the Anatolian sub-group spoken southwest of the capital of the Hittite Empire, Hattusa) meaning 'sky, heaven'. Hence, it would seem that the idea of the sky similar to a large inverted bowl in Mycenaean and Homeric Greek, is connected to the Luwian hieroglyphic sign for 'sky' which is represented by a bowl. Lexical relations between Mycenaean, Ancient Greek and Hittite involve the Mycenaean word ku-an-wo, that would mean _kuwanos_, vitreous dark blue enamel or lapis lazuli, and the Hittite word _kawamna_, copper and N.A4 _kwananna_, a precious stone, probably lapis lazuli. Also the Latin word caeruleus / cerulean is problematic: it may derive from an adjective *caeluleus* (from the noun _caelum_), meaning sky blue, blue, dark blue, dark green, but also dark, obscure, black (http://latinlexicon.org/definition.php? p1 = p2 = 1001985 & c). The Wikidictionary

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(http://en.wiktionary.org/wiki/caeruleus) states that it is relevant to the sky, the sea, the rivers or the sea and the river gods, dark-colored, dark blue, dark green, cerulean blue, dark, black things. The Latin word *caeruleus* was applied by the Romans to the sky, the Mediterranean Sea and occasionally leaves and fields. The Italian Dictionary (http://www.grandidizionari.it/Dizionario_Italiano/parola/c/ceeruleo.aspx?query=ceeruleo) defines the word cerulean: A1 literary: What is the color of the clear sky; light blue eyes. 2 literary: Said of a person who has blue eyes: ‘cerulean Germans,’ Carducci. B masculine noun, literary: Cerulean color.

The Etymological Dictionary Italian or DEI (http://www.etimo.it/?term=ceeruleo) writes that it comes from the Latin *caeruleus* and poetical *caerus*, that is *caeleus* and *caelus* from *caelum*, sky. Used properly for the sea, where it is very deep and far from the beach, because it reflects the image of the blue sky, reflected in it. The DEI, speaking of the sky, also says that Latin *caelum*, *caelum* is related to Greek *koilos*, hollow; cavity, that is the concave part that surrounds it. It is an etymology that others consider dubious, but I find it interesting because it brings us back to the idea of the sky as an inverted bowl.

Ancient writers loved to create false etymologies, for example (Sandywell 2012: 189) Marcus Tullius Varro in *De lingua latina* derives *caelum* from chaos. Chaos gives *thrum*, then *ceorum* (hollow) and then *caelum* embracing the earth, the *ceorum caelum*. Pliny the Elder (NH II.9) follows Varro, adding that *caelum* comes from *caele* to engrave. These spurious etymologies are also found in Isidore of Seville, the seventh-century-A.D. scholar, who writes that the *caelum*, the sky, is so named because it is like a *caelatum* vessel, an engraved bowl, because it is impressed by the light of stars as engraved figures. The chisel or silversmith burnin, *cilium*, is the tool to engrave (*caelare*) gold and silver and dishes, and its name is related to *caelum*, adds Isidore, who also takes a curious etymology from Quintilian, that believed *caelum*, sky and *caelines*, bachelors, were related. Bachelors, men without a wife, would derive their Latin name *celibes* from the fact that Saturn castrated Caelus (Uranus), but as it is obvious within a Christian false etymology, also the inhabitants of heaven would be sexless because *caelines*, bachelors, would mean *caelo beatus*, blessed in heaven. Of course, this etymology is reported by almost all the ancient grammarians and was also adopted by the medieval Church, in its arguments in favor of celibacy.

An interesting site for astronomy (http://www.constellationsofwords.com/Constellations/Caelum.htm), notes that when La Caille called a constellation Caelum, he had in mind precisely the chisel or burnin and the constellation Scutum, Latin for Shield, got its name because of the etymological relationship between *Caelum* and *Scutum* through the proto-Indo-European root *kaz-id* ‘hit, beat,’ which also gives caesura, break, cement etc.. The etymology that connects the sky and the chisel finds supporters also among modern linguists. McCormack and Wurm (1978: 475), for example, argue that the Latin *caelum*, which means both ‘sky’ and ‘chisel’, is morphologically related to the Latin verbs *ceedo*, hit, cut. This noun, like the linguistic reflexes of the Proto-Indo-European *baekmon* defines the chisel as a source of hammering, noise or devastating effect. Hence it serves as a metaphorical expression for ‘sky’ as the source of the noise of thunder, and so on. Here the authors refer to the Proto-Indo-European word *baekmon* and its semantic reflexes. As noted by Thomas D. Worthen (1993), it is a word difficult to interpret because from the same root derive ‘hammer’, ‘rock’, ‘stone’, ‘sharpness’, ‘lightning’, ‘thunder’ and ‘sky’ in the Indo-European daughter languages. In Greek, for example, *akimon* (Ἄξιεως) is a rather rare term that is most often paired with a hammer (*sphura*) and is described as a tool of the blacksmith. In the *Theogony* (717) Hesiod describes Zeus hurling the Titans as an *akmon*, a bronze hammer, down onto the Earth and then as an anvil into the Tartarus. Similarly Zeus, angry with Hera, throws her son Hephaestus, the blacksmith god, down from the Olympic sky onto Lemnos, at the end of the first book (595-601) of the *Iliad*. In essence, the god of the forge and anvil can be hurled out of the sky from the Lord of lightning, Zeus.

In addition to ‘rock’ Liddell’s Greek lexicon glosses the term *akmon* (Ἄξιεως) as ‘meteorite’, ‘lightning’. Calin (2007) believes that the Greek *akmon* is, more specifically, the night sky, as well as being a rock and a lightning bolt. The Sanskrit *asman*, which is derived from *baekmon*, is also quite rare and refers to the weapon of the god Indra, the ‘furious stone,’ but it can also denote simply the sky. Basically the proto-Indo-European word *bekmon* refers to the belief that stone ax heads and arrow points were fallen and solidified lightning, a belief that has been handed down from the early history because, when a farmer found a flint point or the head of a stone ax, he said it was what was a left of a lightning. In the Indo-European mythology thunder is associated with celestial missiles and hammers and also with the wheels of the wagons that rumble like thunder. In fact, one of the symbols of Slavic god of thunder, Perun, is a six-spoked wheel.

Going back to the arms of Indra, the flaming disc *chakra*, the lightning *vajra or ojas*, the first variant of the latter leads to the compound word *vajra-Nabha*, ‘navel lightning’, where the second element *Nabha* refers to the hub of a wheel, then, by similarity of design, the hub around which the sky rotates. *Nabho* in its heavenly connection
becomes part of a compound word, *nabhi-yoni*, in which the second term means 'vagina'. These etymologies reveal a huge system of meaningful interconnections: the world, as a spinning wheel on its hub-navel, revolves around a pivot which has a sexual meaning. Cuzzolin (2013: 14) adds that the Vedic Sanskrit word *asman* means 'sky' and the Greek word *akmon* means 'anvil' but also 'meteorite' and both words are connected with Lithuanian *akmuo*, 'stone', for example. This scholar points out that in Vedic cosmogonic myths the sky was seen as a huge slab of stone. For its part Paulis (2013: 106-278) shows that in the didactic expression of sexual transgression in a seventeenth-century Spanish-Sardinian song book, as well as in Calderon de la Barca, the 'sky' still retains its sexual connotation, usually used to mean 'vagina', but also a passive homosexual.

The Indo-Europeans believed in the existence of a stone sky, which is also found in the skaldic traditions and the Scandinavian Edda (Calin 2007) as well as in the Avestan texts: the ancient Iranians believed that the sun, moon and stars were set in a stone sky. The theory of a crystal clear sky, through which the light of the stars could pass through, probably caused the ancient scholars identify the created sky with the 'firmament' (*ståbr*, *Bundahish*), which was placed under the spheres of the sun, moon and numberless stars (Kreyenbroek 2011). The idea of a stone sky can be also traced in the Babylonian concept of three skies made of three semi-precious stones, and there are hints of a metallic sky in the ancient Hebrew beliefs and the Persian Young Avesta. Besides, the copper / bronze sky, *kalkeos*, *poliskalkeos*, or the iron sky, *sideros*, of Homeric Greeks may be, like that of the Jews and the Persians, a later Bronze Age and Iron Age adaptation of the idea of a stone sky. The Greeks, however, 'settled' their cosmogony creating a god Akmon, Ouranos' father, as a partial substitute of the Indo-European *Dyeus. According to some, the Proto-German word *hemena* (from which the Old English word *heofon*, Modern English heaven, sky, paradise) comes from the same proto-form *baekmon*, Greek *akmon*, Sanskrit *asman* and Avestan *asman* also come from. Not all Indo-Europeans linguistically fix this idea: the Hittite, Lithuanian, Slavic and Celtic languages (for example, Ben Nevis = Sky Mountain, in Wales) derive the words for the sky from another focus, the clouds, drawing from the Proto-Indo-European term *nêbhes*, cloud (West 2007: 342-343).

It remains open the problem of the color of the sea and earthquakes demons that still in Virgil's times were described as cerulean: Alecto, the fury of the sky-blue mane (*Aeneid* VII 346), Scylla and the rocks deafened by cerulean dogs (*Aeneid* III 432), Poseidon flying light on the cerulean chariot sliding on the waves (*Aeneid* V 819), not to mention Charon similar to the Ertrasus demons with his cerulean boat. In Apuleius (circa 125-170 AD), Portunus, the Roman god protector of ports, has a cerulean beard and Thetis, the sea goddess, has a cerulean womb and a glaucous bosom in the *Georgica*, II 53 (Luzzatto and Pompas 2001).

The colors of the Mycenaean Greeks

Warburton (2007: 34-35) points out that the discussion on the Greek basic color terms took different scholarly approaches: on the one hand there is the traditional philological approach represented by Lyons (1999), which connects Homeric and classical Greek terminology and compares them with classical Latin. More recently, Blakolmer, Nosch and others have analyzed the color terms of the second-millennium-BC Mycenaean Linear B texts and have associated them with the Homeric and Classical Greek ones. Adding *khloros* and *polios* to the terms identified by Lyons, Warburton broadens the terminology of classical Greek colors to white, black, yellow, blue, red, violet (purple), scarlet, green and gray. Lyons comments the alleged Greek deficiency involving the blue color, saying that the existing terms are not suitable, but Warburton, while recognizing that the vagueness of green and blue terms (*kuaneos*, *khloros*, *glaukos*) remains, tries to attract the reader's attention to the perhaps most important fact of the partition of the spectrum, that is, the multiple reds (*erubros*, *phoinikos*, *porphuros*).

Blakolmer (2000: 226) tends to consider thirty-nine Mycenaean Greek words as possibly related to color. As in Akkadian, many of the Mycenaean words refer to cloth but not to other items, and include terms which later define the color in Greek regardless of the context. All color terms that are commonly found in classical Greek can be found in Mycenaean, and all Mycenaean color terms are contextualized with categories of objects such as plants and fabrics. According to Warburton it is very important that the words for black, green, blue and yellow are not used in Mycenaean Linear B texts with reference to more than two categories, while there are two terms for white and two for red. This proves that many Mycenaean color terms are directly related to this or that material and that the idea of color as an abstract property had not yet discovered. Multiple terms that make the Greek blue unclear, therefore, must be studied together with multiple reds and have similar problems. However, Warburton provides the most used Mycenaean color terms: brilliant / *re-u-ko* (Greek *leukos*), white / *pa-re-ko* (Greek *phalaros*), red / *e-re-to-ro* (Greek *erubros*) violet-purple / *po-ni-ki-jo* (Greek *phoinikeos*, i.e. Phoenician).
Following Andrea Sinclair (2014), more or less in agreement with Blakolmer, from the Mycenaean Linear B archives we can infer that there were at least thirty-eight terms related to color or colored commodities in the Late Bronze Age Aegean. Of these, two terms identify specifically 'color' as a designation, i.e. 'ko-ro-to', which means 'colored' and it is the predecessor of the ancient Greek adjective Χρώς, Χρώτος (choiros) and its opposite' in-ko-to ro-we ('χρωμάτισ', i.e. 'not colored'. They are two basic words in Linear B involving color or its absence in Mycenaean Greek and describe, as the later ancient Greek adjective Χρώς, the surface or the nature of an object, the complexion, the flesh of a person. As for Egypt and Mesopotamia, there are also words related to patterning, considered here as a factor defining color: po-ki-ro, which is the predecessor of the ancient Greek ποικιλος (poikilos) i.e. pattern, variegation or dappling. Two thirds of the Mycenaean terms seem to describe aspects of light and dark or shine and shadow, notions that do not emphasize so much the color as the surface gloss. Almost one third of the terms in Linear B imply the idea of shimmering and glistening, and overlap in meaning with the idea of patterning.

Shades of red, which amount to almost one third of the Mycenaean terms of color, from rose-red to dark red-purple, are dominating, but there are only two words for yellow shades and two for the blue ones, albeit they are more grounded in notions of brightness and darkness rather than hue. Pale gray-blue and intense dark blue-purple seem to govern the range of blue in a later period (Classic Greek γλαυκός / Glaukos and κύανος / kuanos). It is interesting that in the Linear B texts it does not appear any terms for green, an indication of considerable cultural difference we will discuss later.

The frescoes of the Minoan period were based on mineral pigments such as ocher for red, orange, yellow, brown and purple, lime for white, charcoal for black and gray, copper minerals for green and a blue synthetic frit from the Egyptian blue (a paste of copper oxide, calcium and silica) for blue, which was also used to produce brown and green. Blue was also obtained from riebkite (a silicate for dark blue), lapis lazuli, copper oxide (light blue) or woad. In the next Mycenaean period frescoes appear more formalized, but the prevailing color scheme favored by the Minoan elite, red, blue and white, continues to dominate the frescoes of the palaces. Yellow and purple play a minor role and the color green continues to be absent.

Red dominates throughout the Minoan and Mycenaean periods both in the texts and in the visual arts and, in particular, it is the primary color of significant palatial areas such as the throne rooms and cult spaces. Although ocher was not rare, alternative means such as carnelian, amber or copper mixed with gold were very precious. Red has a 'masculine' meaning not only because it was used for the skin of male figures in the frescoes, but also because it is the background used for male activities such as processions of men or boxing matches, as well as being preferred for rooms impregnated power. Red was also used for landscapes, outcrops of rocks, crocuses and lilies, blood and wild deer and was an important element of the ritual costumes of both sexes. Orange and brown tended to overlap the functions of red.

However in the Late Bronze Age the red color gave way to another symbol of prestige and power, the blue color with its material and symbolic associations with copper and bronze, cobalt, lapis lazuli, turquoise and blue frit. Throughout the Aegean blue had connections with the divine and appeared ubiquitous in the objects of funerary cult, jewelry, hair and the ritual costumes of the elite. Blue was associated with sacred exotic animals such as vervet monkeys (Chlorocebus pygerythrus) and griffins. It was also used to represent vegetation, especially sacral ivy, rosettes, sea daffodils (Pancratium maritimum L.) and crocuses. As in Egypt, blue was used to paint young people's hair, birds, water and aquatic animals. Purple and gray tended to overlap the symbolic values of blue when they were used.

Yellow possibly ranked third, and it may be equated with the crocus flower and the dye saffron; it appears as part of elderly women's costumes, and looks related to the feminine sphere and female ritual activities, since it is completely missing in the costumes of male figures, who tend to wear red and white or blue and white costumes in cult activities. Yellow was also used in scenes where it appears the sacred Minoan double ax and perhaps as a metaphor for gold and bronze. It was also used to describe landscapes, rocky outcrops, crocus flowers, and predators such as lions, leopards and wild cats.

The white color was also related to the female world, because the skin of the female figures is white in pictorial convention. White was also the epitome of the sunlight and radiance and, like in Egypt and Mesopotamia, it represents notions of purity and divine epiphany. It also appears as a compositional element to balance large areas of red and blue in the frescoes. White dominates the backgrounds, is used for women, antelopes and architectural horns of consecration. Black had a function similar to white and, in addition to indicating the hair of adults, it worked as a compositional element to outline forms.
Finally, Sinclair (2014) points out that it seems to have existed some form of taboo for the green color, because whenever a green pigment should appear in the compositions, it never appears, but it is replaced by blue, and the word green is absent in Linear B texts. However, the most ancient Minoan frescoes used green to paint vegetation. Gold can be assimilated to yellow, but from what appears in ancient evidence, it could also be considered a red hue, especially when it was mixed with copper in alloys. The Egyptians and Mesopotamians, in turn, perceived gold as associated with the sun, radiance and the red color.

**The color of the Greek sea**

Caroline Alexander (2013) discusses the famous Homeric expression *oínopa ponton*, consisting of *oínos*, wine and *pontos*, meaning eye or face, and literally the one with the face (the color of) wine, like wine, vinous, with reference to the sea. The translation 'wine-dark' (dark like wine) was adopted with great success in the famous *Greek-English Lexicon* by Henry George Liddell and Robert Scott published for the first time in 1843. According to these influential scholars the adjective *oínopa* means 'the color of wine,' actually 'the color of dark wine' and is used by Homer in the *Iliad* and the *Odyssey* only in reference to oxen and the sea. Although the Greeks knew white wine, they usually drank dark red wine, and in the Homeric epics red wine is the only wine specifically described. The Homeric adjectives for wine are often *melos* (dark, black), a broad-range term used for ghosts, rage, death, vessels, blood, night and the sea. Wine is also *eruthros*, red, or rather the red color of bronze, and *aithops*, that is brilliant, glittering, an adjective used for bronze and the smoke of the light produced by the fire. In sum, the Homeric wine is dark red and rather than referring to the color, it sets the scene of the action and its affective mood.

Astrid Lindenlauf (2003: 416-433), in her article on the sea as a place of no return in ancient Greece, says that the sea was at the center of the Greek world, and the earth was its fringe, and to it were attributed a wide range of characteristics. The sea was a wild, dangerous and corrupting natural place when it was whipped by winds such as Boreas, it was associated with Poseidon, who was also the god of earthquakes. The sea was dangerous but also a source of life and trade. The character of the sea as a place of many different properties is outlined by the Homeric use of a variety of terms, including *thalassa*, *pelagos*, *pontos*, *sàalos* and *hals*. As Alexander (2013) explains, in its most basic sense, the sea is *hals*, salt, a term used, according to Liddell and Scott, generally for the shallow water near the shore, but the sea as distinguished from the sky and the earth and other types of water is *thalassa*, the elemental sea. But the sea which is defined *oínopa* ‘wine-colored’, is that of the term *pontos*, offshore, the deep blue sea, the ocean, or what English sailors call the blue water. An article in the *New York Times* (Wilford 1983) reported a debate between two Canadian professors, a chemist and a classicist Robert H. Wright and Robert E.D. Cattley and Dr. Rutherford-Dyer in *Nature*, in which the first two stated that the color of Homer's wine might actually be blue, as the Greeks did not drink the wine pure, but diluted with six or even eight parts of water, and if the Peloponnesian soil, where part of the Homeric epic takes place, provides alkaline water, this water was probably enough to make wine blue. Rutherford denied this interpretation, saying that Homer defines the wine red, dusty or black, and offers a meteorological theory, according to which, as references to the wine-colored sea take place in the evening, the sea is the color of good hope, like 'red sky at night, hopefully good weather', and adds that the reflection of the sunset on a dark sea can give a color and a texture very similar to that of the Greek *Mavrodafni* wine, a red wine produced from an indigenous grape.

Returning to the sea as *pontos*, the terms of other related Indo-European languages suggest that originally the word meant 'path' or 'passage' through the water, a road where there are obstacles, a crossing. As noted by Alexander (2003) the Homeric sea is described, be it *hals*, *pontos* or *thalassa*, as hazy, vaguely troubled, dark black, and grayish, as well as bright, deep, thundering, tumultuous, murmuring and stormy, but never blue. The Greek word for blue, *kuáneos*, was not used for the sea until the late sixth or early fifth century B.C. by the lyric Simonides, and even here it is not clear whether blue is understood strictly or as 'dark'. After Simonides the blue value of *kuáneos* is more and more used, until by the first century B.C. Pliny the Elder used the Latin form, *cyanus*, to describe the cornflower, *Centaurea cyanus* whose modern name preserves the memory of the Greek word. But in Homer *kuáneos* is 'dark', possibly 'shiny dark' and is used for Hector's hair, Zeus's eyebrows and the night. As late as the fourth century B.C., Plato defined the four primary colors white, black, red and bright. If a Greek writer put the colors in order he did not do it according to the Newtonian colors of the rainbow (red, orange, yellow, green, blue, indigo and violet) but from the brightest to the darkest. The *Iliad*, however, contains an extensive specialized vocabulary that describes the movement of the light: *args* means flashing or flashing...
white; *aislos*, shining, glittering and the epithet that best defines Hector is *koruthalos*, that is 'he with the gleaming helmer'.

Thus, the terms used by Homer to describe the sea have more to do with the light than the color, the sea is often *glankos or melas*. In Homer *glankos* (hence *glaucoma*) is a neutral color, which means shining or brilliant, even if it came to mean gray in classic Greek. *Melas* (from which melancholia) means 'of a dark shade', 'dark' sometimes translated as 'black', but it is used for a number of things associated with the water, ships, the sea, the wavy surface of the sea, and then the dark shades of the sea as viewed from light transmitted with little or no reflection from the surface, and it is also commonly used, as we have seen, for wine.

Astrid Lindenlauf (2003: 424) notes that the ability of the sea to bury things and people makes it both a landfill where things are download and a contaminated and contaminating place, an ambiguous and marginal place, combined with the darkness, the abyss, semi-human monsters and the Hades, and yet it has the character of very powerful cleansing agent since the deepest antiquity. Both literature and archeology confirm that the ancient Greeks perceived and used the sea as a dumping ground for statues of people fallen into disgrace, ritually contaminated objects and people who were social outcasts, rejected babies, drowned sailors, but it was also more prosaically a dumping site for port areas, city sewers and waste from ships. As Lindenlauf (2003: 428) points out, the sea was an ambiguous place where to store 'waste' in the original meaning of the word, that is rejected things and people, a place where the dead from shipwrecks lay unburied, a serious matter for Greeks adults, but also objects deemed useless or worthless, as dirty water or shards of broken pots. The sea, however, at least for some, was not intended simply as an element with different faces, but more as a space that consisted of different areas to which were ascribed different social values, as the various terms for sea we have seen testify.

The problematic blue and the issue of woad (*Isatis tinctoria*)

The manipulation of color was current not only in the archaic Aegean, Egyptian and Mesopotamian cultures, but also in the Classical Greek and Roman periods: especially during the imperial age the elites elaborated a social codification of the symbolic meaning of color. Ronga (2008: 66) points out that the production and trade of purple textiles in the age of Augustus became the sole prerogative of the imperial family, which controlled the quality of the product, its price and the distribution of manufactured goods. Only the Caesars could raise statues of porphyry, the only stone material that could mimic the saturated purple color. Ronga then considers the fact that the purple color, and generally shades of red, were loaded with such great social values that they partially crystallized the evolution of the categories of color. Emblematic in this respect would be the case of the blue color, which seems to have been perceived as socially negative, due to the fact that it was obtained from woad (*Isatis tinctoria*) was much used by the Celts and Germans, that is it was a color considered 'barbaric' par excellence.

The Romans, writes Ronga (2008: 67) knew both woad (*Isatis tinctoria*) and indigo (*Indigofera tinctoria*), and they could sort out the two pigments, which produce slightly different colors. Yet Roman society, she states, rejected the blue color at least as late as the final period of the empire, when Byzantium became very strong. So if red was the official color of the empire, blue became the color of 'the other', the barbarian. To quote the words of color, says Ronga (following Pastoureau and Maxwell-Stuart, as we shall see later), blue painted itself in dark colors and in the Romans' imagination the enemy became deep blue. Blue was in fact associated with negative values (fear, death, but also the lack of virtue or stupidity) and because of that absolutely refused. As we shall see, the question is not that simple, and Ronga does not take into account the importance of both the divine and royal values of the blue color in the Levant and the Middle East, which the Romans knew well.

Woad (from the Celtic *weid* = wild grass), also known as *glasto, guodo, tintaguada, guadone, vado, glastro* in Italian, also provides a dye (woad or pastel) used in the past to dye yarn or make cosmetic dyes. According to Forbes (1964: Iio), woad is an ancient source of blue known both to the Egyptians and the Mesopotamians, extracted from the leaves of *Isatis tinctoria*, a biennial herbaceous plant whose essential constituent, the *indigo* is the same as that of the indigo plant. When the leaves of *Isatis* became yellow, they were ground to form a smooth paste which was then transformed into oval balls. The balls became dark blue, almost black on the outside if they were exposed to the sun. If they were placed in a closed place, they took a yellowish tinge that was particularly pronounced when the weather was rainy. Before being used by the dyer these balls were ground to obtain a powder, wet and left to ferment for several weeks. The dye provided a strong and permanent blue, but all the three shades present in the different stages of the process bore the same name, woad (McNeill 1972: 28). Barber (1991: 227) is more cautious in recognizing as true woad and not indigo the blue dye of the Egyptians and the Philistines, although she seems isolated in her caution, as recent scholars have accepted the arrival of indigo from India much later.
Barber also reports that Cottes (1916, 1918) claimed to have found blue-colored fibers, presumably by woad, between the fibers from bast fiber in the Neolithic site of Adaouste, France, as well as the remains of insects that produce kermes red.

Franco Brunello (1973) reports that woad was native of the Mediterranean, in particular Turkey and the Middle East, from where it spread to Europe since Neolithic times, as the seeds of *Isatis* stored and the fibers found in the aforementioned cave of the Adaouste, Bouches-du-Rhône, demonstrate. It seems that the Egyptians dyed textiles with woad blue around 2500 BC and later also some bands of the mummies, but woad does not seem to be commonly used until 300 BC. Neolithic people also obtained blue-azure textile dyes from the elderberry, mauve, and iris, while the bilberry had purple hues.

Blue clothes were found in princely graves such as those of the Halstatt Celtic leaders at Hochdorf (530 B.C.) and Hohmichele, Bavaria (circa 8th-5th centuries B.C.), and the first-century-A.D. Germanic grave at Lonne in Hede, Denmark. A box of woad seeds was included in the royal ship burial in Oseberg, Norway, dated ninth century A.D. John Edmonds (2006: 7) reports that in Greece, as stated by Theophrastus and Dioscorides of Cilicia, woad was used for the blue dye, that the Greeks called *isatin*, yellow came from *Reseda luteola*, red from madder (*Rubia tinctorum*). He points out that Plutarch wrote that a yellow dye (very expensive, I might add) was obtained from saffron (*Crocus sativus*), especially for women's clothing. The Romans called woad *vitrum* or *glastum*, *vitrum* is the Latin translation of the Celtic word *gla*, which means both glass and blue and that, as we wrote earlier, also means green.

Caesar in the fifth book of *De Bello Gallico* writes that all Britons smear themselves with woad 'which produces a blue color and with which they take on a horrible aspect in battle'. Pomponius Mela states the same thing when he writes that the Britons decorate their bodies with woad and one does not know whether they do it for decorative or other reasons. Pliny the Elder, for his part, says that 'the wives and daughters of the Britons sprinkle their bodies with woad and walk around naked and they are the color of the Ethiopians [black]'.

Gillian Carr (2005: 273-292), speaking of woad, tattoos and identity in Britain in the late Iron Age and early Roman age, questions English translations from Latin, which in some cases date back to the sixteenth century, when woad was a popular dyeing plant. She believes that these translations possibly misinterpreted the meaning of *vitrum*, which also means glass and crystal, and interpreted it as woad. Caesar's words: 'Omnes vero se Britanni vitro inficiunt, quod caeruleum efficit colorum' should be translated: 'they paint with bright dyes' indicating body painting or perhaps 'become infected with glass' implying that glass was used to puncture the skin to make tattoos or even ritual scarifications.

However, this scholar points out that the link between *vitrum* and woad is found in Vitruvius (vii, 14, 2), who uses the term *vitrum* for woad and also provides the Greek term *isatis*, and that Pliny writes that the leaves of a wild grass called *isatis*, pounded with pearl barley, are good for healing wounds, while another type of *isatis* is used by wool dyers. Pliny then adds that the, in addition to being good for wounds and stopping the bleeding, the *isatis*, as woad, looks like sorrel (*Rumex acetosa*) in the leaves, which in fact are lance-shaped in both plants and attached to the stem. Other authors such as Ovid called the Britons 'woad-blue', but also 'green' as actually the woad dye can give a green hue depending on the mordant additives. In fact, woad can also give a black precipitate if left on too long and then dye the skin black, if overexposed to the vat, as it happened to woad collectors' hands after harvest. This would explain why the Britons were compared by Pliny to the Ethiopians, but it certainly does not mean that the Romans saw blue as black, as stated by some in a short academic debate on the subject.

Carr reports that while Claudian, Herodian and Solinus appear to describe drawings of the Britons' tattoos, Pliny, Caesar, Martial and Pomponius Mela seem to describe the application of a single color. The explanation may lie in the fact that, given the qualities of disinfectant that stops the bleeding and soothes the pain, woad was inserted into the wound, and this would explain the hints that the Celts were marked by iron (Caesar, Claudian) or that every man wore the decorations he had earned (Tacitus for the Germans) both as colored scars and tattoos. Given the disinfectant, healing and pain relief properties of woad, it is very likely that it was considered a magical plant that also gave invincibility to those who sprinkled it on their bodies. From the graves, however, it would seem that woad powder for tattooing, buried in a box to crush it and the cosmetic binder agents, and tattooing themselves with specific designs, are part of small objects and practices of body modification of restricted use, reserved for certain elements of the Celtic elite because of their status prerogatives. Carr highlights the fact that in the first and second centuries A.D. Britons cultivated a hybrid Celtic-Roman identity where painting and facial and body tattoo was a symbol of Celticity, but with the passage of time, and judging
by the cosmetic grounding objects in the burials, used until the fifth century A.D., the Britons became more and more Romanized accepting 'Roman' style body care and cosmetics.

Now, as woad was a dye commonly used since the Bronze Age, is it possible, to return to the beginning of this discussion, that the Romans, who certainly could not consider truly barbaric Mesopotamians, Egyptians and Jews, have considered in a negative way the 'barbarians' and their woad blue dye only after meeting with the Celts, also reinforced by Greek prejudice against them? In fact it is well known that the Greeks and Romans considered blue eyes, typical of Celtic and Germanic peoples, ugly. Let's look at other problematic colors.

Hyacinth, glaucous and perse

a) Hyacinth

Hyacinth is defined by Pasini (1830: 181) in his Italian-Latin Dictionary an adjective in the Persian language indicating 'the color of hyacinth'. Hyacinthus, feminine, would be referring to Pliny the ghiacinto or hyacinth, a precious stone of which there are several species, being some white, some yellow, some other bright red, others the color of moss. Hyacinthus, masculine, again by Pliny, would be the hyacinth, a dark purple flower. In his Lexicon graecolatinum, Volume 2, 1552 Frederic Morel defines the adjective hyacinthinus as 'nubiger, purpureus'; the Oxford Latin Dictionary, 1982 (OLD) defines the Latin adjective hyacinthinus, hyacinthina, hyacinthinum as hyacinth / violet / blue / sapphire / purple violet. Handed down to the English language via Greek, Latin and French, hyacinth denotes a flower identified with the myth of Hyacinth and a gem, perhaps a sapphire, in the sixteenth century.

Irving Ziderman (2008: 37) points out that in the Tyndale Bible (1529), the Hebrew term tekhelet, which we have seen before, is translated as hyacinth, while in the King James's Version (1611), tekhelet is translated as blue. In English, the term blue has changed since the seventeenth century: in fact, in the nineteenth century the word blue was used to describe ponies, pigs, cows, milk, flint, a number of animal diseases (bluetongue of the cows, 'blue disease' of the sheep, also called blue-spald or even black-spauld, that is anthrax in cattle and sheep, etc.), many plants some are thought of as blue, but many others as green, for example, some ivy or marsh grass, birds that many call gray, brown and black, such as the hedge sparrow, the pigeon, the black tern. The blue color in English had an important social-emotional symbolic value: a blue day is a bad day and being blue means to be sad, but at the time of Shakespeare blue was the color of the clothes of the servants and could be used to mean 'lower-class person'. A blue-gown in Scotland was a beggar with a license to beg and a blue-belly was a Dissenter. Given this sense, it is clear that at that time an azure-blue or other expensive shade was not imagined. It seems that the change of the meaning of the adjective blue to signify blue-blue as well as blue-red, blue-green, blue-violet and so on, begins in the eighteenth century, certainly after Newton, and it took a lot to enter dialects, while the range of violet and indigo shrank almost to disappear in modern English.

Ziderman (2008: 39-40) also notes the term tekhelet was translated as 'hyacinth' in Greek by Hellenistic Jews and in Latin by the Romans. In classical Greek hyacinth was a flower and not the violet purple from Muricidae shellfish, but the new use of hyacinth to define a color of a fabric seems to have derived from a similar shade of Hyacinthus orientalis L., a violet flower native of the Phoenician hinterland. Together with this Hellenistic Greek usage of hyacinth, there is a hyacinth described as one of the two classes of purple dye by Pliny the Elder (XXI.lxxii.45-6 book, also called 'amethyst and' ianthino ') in Latin. Previously (book IX.lxi.130-lxiv.140), Pliny describes two 'hyacinthine' dyes, that is the purple / violet hyacinthinus derived from a mixture of bacinum and pelagia shellfish, and a paler type, also called corythia made by pelagia alone.

The Treccani Dictionary (http://www.treccani.it/vocabolario/giacinto/) writes for: hyacinth (ancient and literary hyacinth) masculine noun [from Lat. hyacinthus flower and stone gr. ὑάκινϑος]. - 1. Plant of the Liliaceae family (Hyacinthus orientalis), native to western Asia, extensively cultivated in Europe, especially in Holland, and here and there gone wild. It is a bulbous plant with a rosette of linear leaves, fluted, and a scape 20 to 30 inches long, ending with a raceme of very fragrant flowers, light blue or deep blue in the cultivated species, white, rosy yellow, or bluish black. 2. In mineralogy, a variety of zircon from orange to reddish or yellowish; in jewelry, the name is extended to other stones of the same color, such as spinel and garnet; Compostela hyacinth, opaque variety of quartz colored red by hematite pigment, which is extracted mainly in Spain, often used as a gemstone; Ceylon hyacinth, another name of essonite; Oriental hyacinth, the orange variety of corundum.

In the Odyssey, however, Odysseus’ hair are called 'hyacinthine', which many interpret as red, from a variety of Phoenician hyacinth cultivated in Greece, but in my opinion it is to be considered blue, also because his beard is blue, otherwise poor Odysseus would have his hair of a red tending to purple! Given the age of the Odyssey it
would be worth investigating whether this variety of hyacinth imported from Phoenicia was already cultivated in Greece in the ninth or eighth century. B.C..

b) Glaucus

Glaucus (Γλαῦκος) is the name of several mythological figures: 1. Glaucus very valued for his wisdom and its valor is, together with Sarpedon, captain of the Lycians come to the aid of the Trojans. Remarkable the meeting of Glaucus and Diomedes in the sixth book of the Iliad (vv. 226-236), where the two warriors recognize their old ties of hospitality and avoid therefore to fight each other and even exchange weapons as a sign of friendship, although Diomedes' ones are worth nine oxen, and Glaucus' ones a hundred. This episode became a classic example of the gift economy. In Quintus Smyrnaeus (Postom., III, 216), Glaucus tries to carry away the dead Achilles together with others, but is shot down by Ajax, son of Telamon. His body, at Apollo's behest, is removed and transported by the winds to the pyre in Lycia where it is given burial. In Lycia he was honored with a heroic cult.

2. Glaucus, a fisherman from Anthedon in Boeotia, born from the eponymous hero of the city and Alcyone (according to others from Polybus and Euboea, or Poseidon and a Naiad); after enjoying an extraordinary herb he became a sea god. The most detailed account of the legend is in Servius (in Vergil, Georg., I, 436) and in Ausonius (Moselle, 276 et seq.). According to it, one day Glaucus, while he was resting on the shore after fishing, saw that, if they came in contact with a certain herb, some fish next to him came back to life and darted into the sea. Intrigued, he wanted to eat the herb and then leaped into the waves, and found himself transformed into a sea god. His prophetic ability is sometimes greatly enhanced: according to Nicander, Apollo was a disciple of his, and Virgil writes that the Sibyl of Cuma was his daughter. He also appears in the myth of the Argonauts: a legend tells he is the builder of the ship Argo, another one tells he followed it for a long time uttering prophesies.

3. Glaucus, son of Minos and Pasiphaë. As a child chasing a ball or a mouse fell into a pithos full of honey and died. Minos consulted an oracle (either some Curetes or Apollo), who proposed a riddle and said that the person who had been able to solve it (a calf that changes color, white, red and black, several times a day), will find Glaucus. Polyidus found him dead, and Minos forced him to resurrect his son, closing Polyidus in a cave with the corpse of the child. In that cave Polyidus saw a snake that was approaching the body of Glaucus and killed it; a second snake, seen its fellow dead, disappeared to return shortly after with a herb it put on the body of the reptile. After a few gasps, the dead snake came to life. At the sight of this scene Polyidus took the herb and applied it on the body of the child, which soon revived. Minos - not happy yet - wanted Polyidus to teach Glaucus the art of divination, a task the wise man fulfilled, only to make him forget it just before returning home. Glaucus later led an army to attack Italy, and so introduced here the military belt and the shield. He begot then a daughter who was the priestess of Apollo and Artemis Trivia that appears in Book VI of the Aeneid (from Angelo Taccone, Treccani, 1933, <http://www.treccani.it/enciclopedia/glauco_(Enciclopedia-Italiana)/> and Alena Trckova-Flamee "Glaucus." Encyclopedia Mythica from Encyclopedia Mythica Online. <http://www.pantheon.org/articles/g/glaucus3.html> [Accessed August 19, 2014]).

In the last two versions in particular (in the Cretan one there is also the element of the fermentation of honey into mead) a crucial detail is that of the herb that gives life to the dead, as well as the strong relation of the character with prophecy. A similar story of a herb that is known to revive the dead appears in the Babylonian epic of Gilgamesh, which probably entered the Greek myth with influences from the Near East. However, the first Glaucus, in the Iliad, may be a clue to it, together with the serpent as a creature of wise esoteric knowledge and a symbol of immortality, which is connected in Crete with the Snake Cult.

Terence McKenna (2010: 127), in his famous book on the sacred plants causing altered states of consciousness, analyzes the Cretan myth in particular and draws interesting conclusions. He first analyzes the names of the two characters, Polyidus, 'the man who has a lot of ideas', and Glaucus, 'blue-gray', and concludes that it is the latter the entry point in the intention of the myth. In fact, it is well known among mycologists that the pulp of Stropharia cubensis (a hallucinogenic mushroom that also exists in Italy) and other mushrooms of the genus Psilocybe, that contain psilocybin, has the capability to become blue when bruised or broken, an enzymatic reaction and a good indicator of the presence of psilocybin.

The Psilocybe are small mushrooms with a mycenoide or collybioide aspect. The genus Stropharia in Europe comprises about a dozen species, which grow on the ground or wood, in some cases fimbicolous (that is growing in or on dung) characterized by homogeneous flesh, a ring at the stalk and brown-purple-violet spores. Sometimes, especially at its base, they are bluish-green in color. Mushrooms that have no food interest belong to
the genus *Psilocybe*, but in many parts of the world they are consumed for their psychedelic properties due to psychoactive alkaloids psilocin and psilocybin in them, which have a marked effect on the central nervous system. The two alkaloids were isolated in 1958 by the Swiss chemist Albert Hofmann, who aimed at establishing similarities and differences between psychedelic mushrooms and LSD. *Psilocybe cubensis* also known as *Stropharia caerulens* has outstanding psychedelic properties. It can cause hilarity, distorted perception of reality and time, amplification of the senses, synesthesia. The color blue (called bluing) takes place after the extirpation for internal chemical reaction as a result of the contact with the hands of those who collect the mushroom. *Psilocybe semilanceata* is a hallucinogenic mushroom which contains psilocybin and psilocin, which also grows wild in the Italian mountains, a little higher than common edible mushrooms (cep or *Boletus edulis*). Being whitish or light brown, it may fall within the definition of glaucous, a notion confirmed by the fact that there is, as we shall see below, the *caeruleus* variety.

As stated by Samorini (1993), psilocybin and psilocin, compounds isolated for the first time from *Ps. mexicana* Heim, are virtually equivalent in power and it is thought that, in the oral assumption, the first compound is transformed into the second by a process of dephosphorylation. It must therefore be psilocin the real responsible for the effects on the human central nervous system. The typical dose of psilocybin mushrooms, corresponding to the amount of 10 mg of psilocybin, is represented by the weight of 1-5 grams of dried mushrooms, taking into account that the total amount of alkaloids varies on average between 0.1 and 0.6% of the dry weight. The first effects usually appear after 20-30 minutes after the ingestion of the carpophores (fruiting bodies) and their appearance seems to be more precocious and decisive if ingestion occurs on an empty stomach. After a short first phase characterized by feelings of weakness, tremor in the lower limbs, perceptions of internal abdominal movements and, in some cases, nausea, a second phase takes over during which one experiences vivid perceptions of colors, temporal distortions with contraction of time, until one gets real hallucinations, dream-like euphoric dimensions, accompanied by intuitive, creative and emotional states specific to each subject, which can be considered as the true effects desired by the average investigator. These effects usually cover a period of several hours (3-6); it remains a good memory of the phenomena experienced. In the same habitat of *Psilocybe semilanceata* one can find *Ps. callous* (Fr. ex Fr.) Quel., with some frequency. It is similar to the previous type, so that it is normally confused with this; in many cases such confusion has reached European mushroom herbaria. Among scholars there is still some disagreement about the nomenclature of this species, which is otherwise known as *Ps. semilanceata* var. *caerulescens* (Cooke) Sacc. and brought within the range of *Ps. cyanescens* am. Kriegsteiner, but its hallucinogenic properties are confirmed by the use made of them in North America and Europe as a psychoactive drug.

Little known mushrooms, which are bluish or light bluish also in the hat are *Stropharia aeruginosa*, also known as *verdinigris agaric*, *Stropharia coerulaea* Kreisel and *Stropharia pseudocyanea* (DESM Br) Morgan, sometimes referred to as poisonous, sometimes only inedible because of its bad taste. To return to MacKenna, the name of Glaucus, meaning 'blue-grey', the child died and kept in a jar of honey (honey was used by the Egyptians in mummification), seems to be symbolic of mushrooms belonging to genus *Psilocybe* and *Stropharia*, which could be added to honey or mead in certain ritual contexts. In fact, Wasson often mentions honey in connection with the Soma in the Sanskrit *Rig Veda*, but does not believe it is mead, but the hallucinogenic mushroom *Amanita muscaria*.

As to the color expressed by the adjective Glaucus in Greek Perseus Hopper (http://www.perseus.tufts.edu/hopper/morph?q=glaukos&ie= Admission: *g* *l* *a* *u* *k* *o* *s* & la=greek&can= * g * * l * * a * * u * * k * * o * or * s0) in addition to citing the proper name Glaucus, quotes 1. γλαύξ, *glauks*, *Athena noctua*, a small owl sacred to Athena, hence glaucous, 2. γλαύκος Glaucos, a gray fish fished in the open sea (identified either with the bluefish *Pomatomus saltator*, which would also be the god Glaucus, or the blue shark *Prionace glauca*), the ancient Greeks and Romans found very tasty, and 3. γλαύξιος, adjective meaning 'shining'. The problem is that *glaucus* can mean 'sparkling' in Homer's Greek and 'blue-green-grey' in Classic Greek. Homer would not have understood the inherent coloristic value in the compound word γλαύκοπις *Glaucopis*, epithet of Athena in Homer exclusive, whose original ritual meaning is either looking like an owl or with the eyes of an owl (γλαύξιος glauks + ὄψ oops, ὀμματα ommata), a clear memory of theriomorphism of Greek archaic religion; the para- etymology of the adjective γλαύξιος for a time prompted the interpretation of it glaucous-eyed as either blue-green eyes or with sparkling or terrible eyes.

The Treccani Dictionary (Glauco http://www.treccani.it/vocabolario/glauco/) proposes: Glaucous adj. [from Lat. glaukus, Greek. γλαύξιος 'bright, shining,' and color name] literary: Color between blue and green, or light blue, gray-green, cerulean; the term, precisely because of its vagueness, is common in poetry, with particular
reference to the eyes: ‘of serious glaucous eye within the austere sweetness’ (Carducci); in particular, the goddess with glaucous eyes, an epithet of the Greek goddess Athena (translation from the Greek γλαυκόπις, i.e. gray-eyed); more rarely related to other things: ‘coast all covered with the glaucous paleness of olive trees’ (Pascoli); ‘the great glaucous coolness of a June evening’ (D’Annunzio). In botany, the term designates the green-gray color of some plant organs (for example, the leaves of the irises and many succulents), due to the presence of a wax layer covering the epidermis and masking part of the color below.

Michel Pastoureau, in his history of the blue color (2008) points out that the most used words for blue in Greek were glaukos and kyaneos; the latter, during the Homeric period denoted both the brilliant blue shade of the iris and the black shade of mourning clothes, but never the blue shade of the sky or the sea, as we have already seen. During the Classical period kyaneos meant a dark color, and evoked more a feeling than a true hue. Glaukos, writes Pastoureau, which existed in the Archaic period and was used by Homer, could refer to the grey, blue and sometimes yellow or brown according to the author, and did not denote a particular color, but expressed the idea of the weakness of a color or a weak concentration. For this reason, he said, it was used to describe the color of eyes, leaves or honey. Unfortunately, like many other influential French academic people, medievalist Pastoureau is more brilliant than accurate, having invested so much on his narrative that the blue color was ‘born’ in the twelfth-century Paris where it was taken for the first time seriously, this way overlooking the archaeological evidence on the use of blue since prehistoric times, and also in the Greek-Roman period or minimizing it.

The issue as to whether the Greeks and the Romans could see blue, debated at least since the nineteenth century, is far more complex than Pastoureau writes and to understand it a scholar must still refer to the studies of John Gage (1993, 2000). Unfortunately Pastoureau’s ideas on the Greek and Roman bias against blue were refuted long ago, but still emerge in the writings of Italian scholars, always psychologically dependent on the French, and ignorant of the far more extensive and updated Anglo-Saxon literature on the subject. For example, the French writer argues that Greek and Romans writers used only black, white, red and yellow pigments, when several panels and papyri show also the use of bright blue shades. Even the ‘sociological’ explanation that the Greeks and Romans were hostile to blue, with the well-known quotes from Caesar, Pliny and Tacitus on the Germans and the Celts painted blue, is rather short-sighted, given that the writers were not so hostile to the color, as to the threat posed by the ‘barbarians’.

Many Nordic writers often use the term glaukos referred to the eyes, to argue that in ancient Greece there were many people with blue eyes, a claim refuted by Maxwell-Stuart (1981). This scholar says that glaukos and derivatives were mostly used for the eyes, in particular eyes with glaucoma or cataracts, and given the fear of blindness, light colored eyes evoked in the Greeks the idea of sick and unnatural and therefore they were hostile to the blue eyes, which were rare in Greece and Crete. The fear of the unknown and the unusual contributed to the idea that the holders of such eyes should be evil. From here it derived the association that would exist until modern times between blue and the evil eye in Greece and the surrounding area. Maxwell-Stuart adds that there is no wonder that this hostile feeling was reinforced by the knowledge that aggressive, dangerous non-Greek northern people had blue eyes, intensified by the coupling with blonde hair.

In fact, the adjectives xanthos, yellow, blond, and glaukos are closely associated, as this scholar points out again and again: hence the intensely emotional and symbolic value of glaukos comes entirely from its application to certain types of eye felt as evil, dangerous and hostile and only Athena, of all the gods, possessed them in her role as divine Protectress, like a living charm, together with some Homeric heroes in particular, one of them is the blond Achilles. However, Gunther (1956: 98-104) notes that the Homeric poems describe gods and goddesses as blonde, some with blue eyes. Demeter is blonde, Aphrodite is golden-haired, Athena has blue eyes (glaukopis) and according to Pindar’s she is also xantha, blonde. The term glaukopis was synonymous with glaukommatos, ‘bright-eyed or blue-eyed’, as opposed to melaniommatos, dark-eyed. So in a comment to a passage in the Iliad (IV, 147), the Achaeans hero Menelaus is described as blond, tall and bright/blue-eyed (xanthokímes, mégas en glaukommatos) and also fair-haired are Meleager, Briseis, Agamedes and Helen, called ‘shining’, while the god Radamant, Penelope and Hermione are blonde in the Odyssey. Therefore, both Trojan and Achaean characters are fair-haired. Actually, mortal and divine female characters with dark hair are lacking in the Homeric poems. This suggests that fair hair was considered beautiful and great to look at by Homer, so much so that in a moment of inattention the poet called Odysseus fair-haired, but generally many translators define dark (we already seen it, hyacinthine) his hair, like those of Hector, that are kyaneos, dark blue. In fact, a Greek philosopher and rhetorician from Bithynia in the first century A.D., Dion of Prusa also called Dion Chrysostomos, a courtier of the Roman imperial court, noticed that the beauty of the Homeric Greeks had to be different from that of the barbarians, that is in the Homeric poems they appear dark-haired (kyaneos) as Hector and not fair-haired (xantha).
as Achilles and Patroclus. It is true, however, that Paris had hair as bright as sun's rays or horns (keraglaoi), and that the poet Hesiod (about 700 B.C.) depicts Homeric heroes and gods as well as the god Dionysus, Arianna and Ioleia (fragment 110) as fair-haired (Theogony 947). Homeric women and goddesses are often described as white-armed, silver-footed, etc.

It is therefore questionable whether the term translated as 'fair-haired' corresponds to our concept of blond, when it tries to emphasize the splendor of the divine or semi-divine characters' hair, deities in many cases downgraded to a heroic rank. To return to glaucous, in this case it is not surprising that it is the color of divine or semi-divine eyes. As for the evil eye, we saw earlier how the blue eye, sometimes called the Eye of Ra, is an amulet still common in the Levant, a reminder of the blue eyes of the gods of the Near and Middle East, which represents, in my opinion, less glaucoma and fear of blindness, and more the fear of the sacred not harnessed by the object and the magical-ritual act. We should also remember that, in the tradition of the Greek myth, blindness is closely related to the spirit of prophecy, as evidenced by the prophet Tiresias and the alleged blindness of Homer, which raises the stature of the bard, not diminishes it with a disability. The problem with many interpretations is that they are sometimes literally trivial or looking for a literal response to what is highly symbolic.

According to many scholars, the blue was less important among ancient Indo-European peoples than in the Eastern Mediterranean, Near and Middle East. In fact among the Jews, Egyptians and Mesopotamians the sacredness and regality were always enhanced by the union lapis-blue-gold. Even for the Greeks this color, referred to water, has a meaning related to the divine: Poseidon is described in the Iliad and the Odyssey 'Shaker of the earth' and blue-haired (kuanoncaia) which governs the glaucous (glanks) sea where the wave of his blue (kuanotipidos) wife, Amphitrite, high echoes (Iliad XV 174 XVI 43 Odyssey XII 60). In Virgil, Proteus, the prophetic sea god is cerulean and his sea-green eyes shine with splendor (Georgics IV 388 f). And we have already seen Thetis, the sea goddess whose womb is cerulean and bosom glaucous (Georgics II, 53).

The Romans had the adjective cyanus related to the cornflower, the sky and the sapphire, the adjective caeruleus related to the sky, the sea, the dark blue and the blackish, often used with the meaning of black, the adjective glaucus meaning bright blue, blue-green or green, vitrum or glatinum for blue-azure, from the root glas, which in Celtic meant both glass and blue, as we have already seen.

c) Perse

The adjective perse in ancient times meant 'dark color between black and red', for example in the verse "O gracious and kind animal/ that are wandering through the perse air " (Dante, Inf. V 88-89). The etymological note of Treccani online says: Medieval Latin, persus 'dark', perhaps alteration of a previous poenus (pressior exists in the 1st century AD in the sense of "darker"). The Zingarelli Dictionary, however, shows a different source: Medieval Latin persus (m) 'Persian': from the color of fabrics that came from Persia (?).

Some more definitions from other etymological dictionaries. The DEI wrote: perse adj., ancient, thirteenth century; color between purple and black; masculine, ancient. (Boccaccio), perse color cloth; see. Medieval Latin persus (a. 1209 in Ravenna, a. 1285, in Bologna, in. 1306 in Modena), French pers perse color (12th century), Late Latin persus (8th century, Reichenau glosses) properly 'Persian', probably from the color of silk fabrics which according to Pliny came from the East. The Devoto writes: perse, from Medieval Latin persus (8th century AD) 'perse color', that is 'Persian' because it was the typical color of the fabrics from the East: from persicus (see persica) as poenus comes from poenic (s) us. Both dictionaries claim that the word originates from persicus and similar words (quite convincingly, I think). In Pliny, however, there is pressus (virdidor et pressor sulphuris Pliny the Younger, Letters, VIII 20), derived from to press.

The Free Dictionary (http://www.thefreedictionary.com/perso) writes: Dark grayish blue or purple. [Middle English pers, from Old French, from Medieval Latin persus, back-formation from Latin Persicus, Persian, from Greek Persikos, a Persian, from Pers, a Persian, from Old Persian Prsa, of Median origin; akin to Old Persian Parthusa-, Parthian.]


The glossary entry by Du Cange says: Persus, -a, -num: blue (dark); French pers. Attested in this sense only in Reichenau glosses. Persus certainly derives from the adjective Persus 'of Persia, Persian' that in the late period substituted persicus and had to mean 'peach color'. Persus is to persicus as poenus is to poenicus. It is also argued that...
Persus is derived by metathesis from presus in the sense of ‘grim, dark’, as supposed by Pliny 35, 32 and Pliny the Younger, Ep. 8, 20, 4. With respect to pers, Old French counterpart of Old Italian perso, there is also the voice of CNRTL, which also gives us an explanation of the origin of the adjective from Persia. Also according to Joseph Bruch in Zeitschrift für romanische Philologie (t.39, p. 211), Persus derives from Persia, and in fact, according to the testimony of Pliny the Elder (Hist. Nat. 11, 75-76), in the production of bombicinae vestes (silk garments) they used cocoons imported from Assyria; instead of the word Assyrian, they said Persian, and it is possible that these silk robes were called Persia vestes (Persian clothes). Among these, some varieties were dyed dark blue. In this context the feminine adjective ‘persa’ may have existed from which a masculine ‘persus’ was formed to indicate this color, for a specialized use. The DEI for the Italian perso (perse) (French and Provencal per) refers the derivation from the Late Latin Persus = persicus, Perseus. It is a very dark blue color, and properly between purple and black, similar to the color of the ‘mela persica’ (ad persei mali colorum accedens, Du Cange), that is the peach.

A type of peach very popular with the Romans, was the violet peach or bloody peach, with velvety skin from thick, whitish hairs, which weakens the bloody red conferred by the pulp and makes it grayish. The pulp is almost entirely wine-red, sometimes with slight pink hues, sweet, pleasantly sour, very juicy, tasty. As for the medieval perse, this color is explicitly defined in various documents as obtainable from the dipping in woad (Isatis tinctoria), and subsequently in madder (Rubia tinctorum) or pernambuco / brasil (Caesalpinia sp.) The result should be a blue-violet, that the medieval man categorized as most definitely shifted toward the blue range. As to the identification of perse as black or blackish, the medieval black was also the result of repeated dyeing baths, that is, the basic dyes for red and blue; we are speaking of the intense and bright black, which became fashionable in the 1400s for the upper classes. The black for the poor, however, used for the garments of monks and penitents, was a non-color, and was achieved with the tannins from the nut gall that, when combined with iron salts produced dark, brownish and usually dusty-colored unstable iron tannates. So, even considering the term perse meaning black, it is a black which is actually a blue devoid of yellow and carried to the extreme, so as to appear black. Hoshino (2001) writes that typically the fine cloths were to be dyed in two phases. During the preparation of the wool they were dyed with a blue-azure color, the basis color for all subsequent changes.

In this regard, the degree of the intensity of the blue-azure color was expressed by the following terms used by the merchants of Florence in 1333: from the palest to the darkest hue ‘allazzato (very light blue), turchino (deep blue), turchino al dritto (on the opposite), turchino riporhito, turchino a due volte (twice dyed, the first with woad, the second with verzino, that is brasil Caesalpinia sp.), cilestrino (pale cerulean, according to the Accademia della Crusca the same as Lat. caerdens, Gr. κυάνεος), sbiadato (cerulean, the name comes from biavo, bioio, blue, from Medieval Latin blavus, from Frankish blau), azzurrino (azure, the base color of the woad chromatic range), perse’. In 1428 in Florence we have: ‘azzurrino a 2 sagg, azzurrino al saggio dell’arte, cilestrino, sbiadato di 5 sagg, sbiadato al dritto, turchino a due volte, turchino riporhito, turchino al dritto’. At the end of the 15th century a Venetian dyeing manual wrote this range from the darkest to the lightest: ‘perse avanzata, perse, monegin avanzata, monegin, azuro al dritto over per cupo, biavo/azuro, cilestr, sbianato, turchin, alazzato, alattato’. The precise hue defined by these names is still subject to debate (G. Rebora, Un manuale di tintoria del quattrocento, Milano, Giuffré, 1970, ch. LXIV and LXVI, in Rebuffat 2013).

However, it is evident that the perse color is considered to be in the blue range, and blue from a single dye. In the commentary of 1385-1395 by Francesco da Buti on Inferno VII we read: ‘Perse is dark biadetto’ (a bluish hue, biadetto being a variant of sbiadato). But that perse is also linked to red is always in Dante: ‘Perse comes from the black color ... Perse is a mixture of purple and black, but black wins, and from it takes its name (Convivio IV XX 2); but see. also Inf. V, ‘O gracious and kind animal / that visiting goest through the perse air/ us that dyed the world of blood-red’. Therefore, the reds in this perse seem to be two: blood-red (or cardinal color, that is dark to deep or vivid red) and purple. Both were not produced from the purple from the Muricidae shellfish (a process fallen into disuse in the 12th century), and possibly came from madder or kermes. In the Middle Ages, black is a ‘non-color’ color, ranging from dark brown to wet rat gray to dark blue. Maybe the perse color is so dark and difficult to categorize, to be sometimes perceived as black.

Conclusion

In this excursus on the perception of color and brilliance of archaic and ancient peoples we can agree with Warburton (1012) that the use of precious substances, gold, silver, lapis lazuli, turquoise and carnelian had an overpowering influence both on the language and the ideology of the ruling elites in the Levant, the Near and Middle East, Egypt and the Aegean area. However, it is beyond dispute that the preciousness of these materials...
derived not only from its scarce accessibility and cost of transport, but also from the brilliance that made them obvious incorporations of divine light, a symbol of sacredness similar to the halo or flame on the fountain of the head in Christian or Oriental figures. The ruling classes of the period, at the highest level, consciously manipulated the use of colors provided by the materials and in doing so they gave way to a cognitive process that ended only in the Middle Ages, through which a number of color base terms stabilized and expanded more and more, even if at the expense of the subtle differences in terminology between multiple reds and blues in particular.

Sinclair (2012: 118-149) shows that in Minoan frescoes specific colors were favored at different times: during the MM IB-IIA in the palace of Knossos the range of colors used was at least nine colors, of which the most common were black, white, red and yellow. In the transition period to the MM II, the color range is reduced to seven colors, but with a dramatic increase of the blue sky that replaces the yellow in the amount of use. The manipulation of color, which reflects that on a wider geographical region, is shown not only in the frescoes but also in ceramic and decoration of textiles. In the later Mycenaean period, the use of inserts of dark blue glass paste becomes particularly important for the elites especially in funerary contexts and in contexts of prestige sumptuous displays. The blue color, considered by many scholars to be a problem color in antiquity, enjoyed instead the utmost prestige, coloring the flesh of the Egyptian and Sanskrit deities, Mesopotamian and Hebrew buildings as well as cultal and royal objects and even some features of the Homeric gods. In fact, according to Sinclair, it’s really interesting that, while blue seems not to have its place in the basic color lexicon of ancient peoples, it actually dominates the visual style of the late Bronze Age as signifier of opulence.

One wonders if, by chance the domestication of flax (Linum usitatissimum) had as an incentive the blue color of the flowers, making it preferable as a textile fiber either to other possible choices or to plants used by the common people, but not by the elite. The colored linen fiber discovered in a cave in Georgia (Balter 2009 Kvacadze et al. 2009) and dated 36,000 B.C., although belonging to wild flax, makes us understand that flax had an economic weight very early, until it became very important in the proto-history. Flax is cultivated in the East since the Neolithic Pre-Pottery period as shown by excavations in Nahal Hemar, near the southern end of the Dead Sea, in a cave dated the seventh millennium B.C., and charred linen textiles, dated the sixth millennium B.C., were discovered in Catal Huyuk, Anatolia. The fifth millennium B.C. in Fayum, Egypt, is the date of a linen thread, although it is not clear whether it is Linum usitatissimum, and flax spinning appears in a papyrus of the Eighteenth Dynasty. The first evidence of the domestication of flax appears in northern Iraq and southwestern Iran before 5000 BC, although perhaps at the beginning more to exploit the seeds than the fiber. Linum usitatissimum appears later in southern Iraq, Syria, Switzerland and Germany between 5000 and 3000 BC, and diversified adapting to different ecosystems (Barber, 1991: 10-11). The presence of a Mycenaean textile industry is documented in writing with the Linear B tablets at Pylos, where the ideogram SA is also written as ri-no, Greek λίνον, linon and flax female workers are classified as re-ne-ya, Greek λιναξ, linea.

The blue color, however, in Egypt, the Levant, the Near and Middle East is not an absolute value, but is valued especially in contrast with red and white: objects of precious stones, glazed pottery, faience and glass paste, as well as metal, have a translucent luster, a metallic glint in itself that makes them symbolic objects and associate them visually and semantically with royalty, otherness and the divine in all the cultures of the eastern Mediterranean and Mesopotamia. Sinclair (2012) believes that we are dealing with the aesthetics of an international elite that includes textiles, shapes, iconographic language, brilliance and color showing conspicuously the ideology of the elite about religion and power. Both blue and purple, colors that are especially related to the higher layers of the elite, advertise the same message of both ability to govern and divine sanction. Gerschel (1966: 608-631), speaking of colors in the various Indo-European peoples through the study of their technical vocabulary and certain traditions, shows that in early times ‘the color’ par excellence was only red and that yellow and black as opposed to white, were considered ‘impure’ (the non-nettoyé, the not clean). Referring to the three functions of the Indo-European archaic society according to Dumezil, Gerschel remarks that white was the color of the priestly office, red that of the warriors, while the third function, farmers, dressed in yellow. Actually, it meant that it was neither ‘colored’ (i.e. red) cloth as that of the ksatria (warriors) nor bleached as the dazzling white of the Brahmins in India, dark blue in Iran (according to other sources, it was black, which is together with red and white one of the three ritual colors, but being difficult to obtain this textile dye, the cloth was left in its natural color, yellowish). Gerschel cites, among other classical writers, Plato (p. 612), who wrote that white textiles are suitable as an offer the gods, while the ‘colored’ (bhamata) ones are only suitable to warriors’ garments. He also cites the red flag used to start the battle used by the Greeks and Romans. Livy (IX 40) describes the Samnite army as divided into two groups, one with ‘versicolor’ (red-purple / dark) clothes and
gold crowns and the other with 'candidae' (white) clothes and silver shields, where the first are the real fighters, while the latter are consecrated priests fighting with magic ritual weapons, according to Gerschel. He also sees a clear contrast between white and red clothes in Homer (p. 625). Oddly enough, I might add, in the Spanish language there is what looks like a real archaic linguistic survival: red wine is not 'rojo' (red), but 'tinto', that is 'colored'.

Warburton (2007: 244) argues that from the first Indo-European texts, those in Mycenaean Linear B, there is a strong awareness of the red range of the spectrum, while the blue range is the dominant trend in Akkadian and Egyptian texts. Warburton suggests that there may be an Indo-European tendency to focus less on blue color, while other authors, as we have seen (Pastoureau, Maxwell-Stuart, Ronga), wrote that the Greeks and Romans had a negative bias for blue. We have seen before that this negative bias is relatively untrue: in fact, in the Eastern Roman Empire and later in the Byzantine Empire, belonging to the Greek culture and language, blue purple was so precious to be the prerogative of the imperial industries.

However, in the light of the debate on the ritual division of the colors in the archaic Indo-European peoples, it is possible that this supposed Greek-Roman antipathy for the blue color is due less to Celtic-Germanic 'barbarism', and more to an archaic legacy which allotted blue and black shades to the more mundane of the three functions of the ancient Indo-European society, that of the farmers. It is quite curious, however, that the Germanic and Celtic peoples (and the Slavs, who are more sensitive to blue, as we have seen), whose societies were more archaic than the Greek and Roman ones, have exalted blue. Actually, it is thanks to them that this newly assessed color began a new social life also in the royal function represented by King Arthur's stories, and more generally in the middle Ages' society, born from the fusion of the Greek-Roman and Celtic-Germanic cultures.

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