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ANATOMY AND POSES OF THE HUMAN FIGURE IN ATTIC ART FROM THE LAST QUARTER OF THE SIXTH TO THE FIRST QUARTER OF THE FIFTH CENTURIES B.C.

THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE FACULTY OF LITERAE HUMANIORES (SUB-FACULTY OF ANCIENT HISTORY AND CLASSICAL ARCHAEOLOGY)

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ABSTRACT

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This thesis examines the extent to which a more accurate representation of the human body is developed from the last decades of the sixth century, and the reasons for this development. A sound knowledge of clinical anatomy is used to analyse closely the rendering of features and trace the way the Greek artist looked at his model. The study covers different media found in Attica (vases, sculpture in marble or in poros, bronzes, and terracottas) and shows that artists try to render the human body accurately in all, although the pace of development varies according to the cost, subject and technique used (painting, carving, casting, modelling). This move away from the conventional representation reflects a close observation of the life model even though the human figure is still rendered according to idealized proportions and features. In order to explain this change, literary evidence is gathered to reconstruct the knowledge of human anatomy and body at the time. A rich anatomical vocabulary is already developed in the *Iliad* and the *Odyssey* but is used in descriptions which combine imagination and reality, whereas, from the last decades of the sixth century, the extant philosophical and (slightly later) medical texts reflect a growing concern with anatomical features and internal organs in order to distinguish the human from the animal. This new approach may have influenced the way contemporary artists looked at, and represented the human figure, since it is probable that they knew these theories either from lay-texts, which often reproduce passages of philosophical or medical treatises, or from public lectures and readings.

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I. INTRODUCTION

This thesis aims to examine the extent to which naturalism was developed in Greek art from the last decades of the sixth century to the Persian Wars, and the reasons for this development. The artists of this period concentrate mainly on the human figure, and a study of style depends almost exclusively upon the rendering of the human body, naked or clothed. For this reason, I study the rendering of human anatomy and bodily poses, the latter being mainly determined by the degree of anatomical knowledge.

Much has been written about the experiments in naturalism in Greek art, and it seems prudent to prepare the ground by giving a brief survey of previous scholarship. In the view of some scholars, Greek artists deliberately strove after realistic effects from the beginning of the Archaic period but were able to achieve them only when the technical skills required were developed.[1] There is no doubt that the representation of the human figure becomes gradually more naturalistic throughout the Archaic period and that a better command of technique may have assisted this development. Yet, it is unlikely that, from the early sixth century, Greek artists were aiming at a naturalistic result. They give human figures symmetrical features and conventional proportions, and progress in terms of anatomical accuracy is only partly achieved until the end of the century. As J. Boardman points out, "an artist who wanted to carve or draw an ear or an eye realistically had only to look across the room at his fellows and

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[1]*E.g.* Richter, G.M.A, *Perspective in Greek and Roman Art* (London 1974) 21; and *Kouroi. Archaic Greek Youths. A Study of the Development of the Kouros Type in Greek sculpture*[3] (London 1970), 3-5. Recently, Bruneau, Ph., *La sculpture. Le prestige de l'Antiquité*

copy what he saw, ... wholly representational art was neither understood not sought by Archaic artists, ... who were observing still the Old Geometric formula for composition of parts, observed individually and frontally, and were presenting images to be 'read', not compared with life".[2] In fact, until the Hellenistic period the human body is portrayed in Greek art according to a combination of theoretical proportions, idealised forms and a more accurate rendering of human anatomy and lifelike poses.

However, from the late sixth century, aging bodies, facial emotion, and faces which depart from the common type are occasionally shown, and a more accurate rendering of human anatomy may be observed. Although some scholars questioned these experiments in naturalism,[3] they are generally acknowledged and often connected with developments which occured in other areas, such as philosophy, politics, and literature. The interest in a more accurate rendering of the human figure was related to the rise of self-consciousness and the development of empirical explanation of the world in Greek philosophy, with the introduction of tragedy, and with historical events such as the birth of democracy, or the Persian Wars.[4] Social and political conditions along with philosophical currents certainly exert an influence on

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du 8e s.av. J-Chr. au 5e s. après J-Chr. 1. L'art grec (Geneva 1991), 41; and "Qu'il est d'art qu'abstrait ou du réalisme dans la statuaire grecque", *Topoi* 5/1 (1995) 33-61.

[2] *Greek Sculpture. The Archaic Period*[2] (London 1991), 65. See further, the reply of F. Croissant to Ph. Bruneau,"La sculpture grecque est-elle un art abstrait?", *Topoi* 4/1 (1994) 95-107.

[3] See Neer, R.T., "The lion's eye: imitation and uncertainty in Attic red-figure", *Representations* 51 (summer 1995) 118-134 (I thank Prof. R. Osborne for this reference).

[4] *E. g.* Schweitzer, B., "Die Entwicklung der Bildform in der attischen Kunst von 540 bis 490", *JdI* 44 (1928) 104-131. Schefold, K., *The Art of Classical Greece* (London 1967). Schachermeyr, F., *Die frühe Klassik der Griechen* (Stuttgart 1966) 46. Recently, Hurwitt, J.M., *The Art and Culture of early Greece. 1100-480 B.C.* (Ithaca & London 1985) 310; Stewart, A., *Greek Sculpture. An Exploration* (New Haven & London 1990), 134-135, 141-142. Martini, W., *Die archaische Plastik der Griechen* (Darmstadt 1990), 282-284.

art since the latter is not created in a vacuum. Yet this type of explanation may be challenged on specific grounds. The philosophical reasons are too elusive. Xenophanes' empirical explanation of the world in which human intelligence is the origin of all development, is a conception which remains too wide to be applied directly to art. Additionally, there are other contemporary theories, such as the Pythagorean explanation of cosmic harmony based on numbers, which conflict with that assigned to Xenophanes.[5] The development of tragedy may be related to that of facial emotion and bodily motion in contemporary works of art, since drama displays human and divine passions and actors use masks, postures and gestures to suggest them,[6] but does not explain the growing interest in human anatomy and lifelike poses. Historical events, such as the birth of democracy and the Persian Wars do not provide a comprehensive explanation of the stylistic changes. The *isonomia* established by Cleisthenes was paralleled with the symmetrical display of anatomical features on contemporary works,[7] but cannot be connected with the more accurate rendering of anatomy and motion. The Persian Wars (including the Ionian revolt), occasionally seen as a drama which deeply touched the Greek world, may explain the growing interest in rendering *pathos*,[8] but does not justify other stylistic changes. Additionally, the early democratic regime in Athens was far from typical for

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[5] Ridgway, B.S, "Late Archaic sculpture", *Greek Art. Archaic into Classical, A Symposium held at the University of Cincinnati. April 2-3 1982*, ed. Boulter, C.J. (Leiden 1985) 3.

[6] The rendering of emotion in art has been connected with that in drama by several scholars, see *e.g.* Kenner, H., *Das Theater und der Realismus in der griechischen Kunst* (Vienna 1954). Stanford, W. B., *Greek Tragedy and the Emotions. An introductory Study* (London 1983). Stewart, *Sculpture*, 141-142.

[7] About the influence of the organisation of Attica and the establishment of *isonomia* by Cleisthenes on contemporary art, see, Lêveque, P., Vidal-Naquet, P., *Clisthène, l'Athénien* (Paris 1964), 83-89, and Martini, *Die archaische Plastik*, 283.

the rest of Greece and the Persian Wars did not affect all Greek cities in a similar manner, while a more naturalistic rendering of the human figure is widespread in Greek art from the early fifth century. It is, therefore, clear that Greek art in a given period is not simply the visible expression of contemporary developments in other fields. It is connected with them to form a unified picture of what was sometimes called "the spirit of the age", which, is probably, itself, an illusion due to the historian's task to fit all the available evidence together into a context that makes sense.[9]

Scholars who used widely human anatomy to define artists'[10] and regional styles, [11] and to date works,[12] applied it selectively and sometimes inaccurately,[13] while there is not a study

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[8] See Pollitt, J.J., "Early Classical art in a Platonic universe", *Archaic*, 103; *CAH*^{2}, vol. 5, 173.

[9]As already pointed out by Gombrich, E., *Meditations on a Hobby Horse* (London 1978), 51. Quoted by Hallett who provides further arguments against the *Zeitgeist* theory, "The origins of the Classical style in sculpture", *JHS* 106 (1986) 73-75.

[10] In sculpture, *e. g.*: Schrader, H., "Aristokles", *Die Antike* 17 (1942) 95-126; Dörig, J., "Phaidimos", *AA* (1967) 15-28; Deyhle, W., "Meisterfragen der archaischen Plastik Attikas" *AM* 84 (1969) 1-64. In Attic vase-painting, the main work remains that of Beazley (see *Attic Black-figure Vase-painters* (New York 1978), *Attic Red-figure Vase-painters*^{2} (Oxford 1963), *Paralipomena Additions to Attic Black-figure Vase-painters and to Attic Red-figure Vase-painters* (Oxford 1971), *Beazley Addenda, Additional References to ABV, ARV*^{2} *& Paralipomena,*^{2} compiled by Carpenter, T (Oxford 1989)). For his method of attributing vases to individual painters, see Kurtz, D. C, "Beazley and the connoisseurship of greek vases" *GV J. Paul Getty M* 2 (1985) 237-250; Robertson, C. M., "Beazley and Attic vase-painting", *Beazley and Oxford* (Oxford 1985) 19-30.

[11] *E. g.* Langlotz, E., *Frühgriechische Bildhauerschulen* (Nuernberg 1927). Wallenstein, K., *Korinthische Plastik des 7. und 6. Jahrhunderts vor Chr.* (Bonn 1971). Croissant, F., *Les protomés féminines archaïques. Recherches sur les représentations du visage dans la plastique grecque de 550 à 480 avt. J.-C.* (Paris 1983). Walter-Karydi, E., *Alt-Ägineten II, 2: Die Äginetische Bildhauerschule: Werke und schriftliche Quellen* (Mainz 1987).

[12]Sculpture has been classified into chronological groups according to the degree of anatomical knowledge displayed, see Richter, *Kouroi*^{3}; the rendering of anatomy is an important aspect in relating vases to sculpture in order to assign them dates. Among the first to compare both media was Langlotz, E., *Zur Zeitbestimmung der strengrotfigurigen Vasenmalerei und der gleichzeitigen Plastik* (Leipzig 1920).

which focuses on it in order to understand the extent to which a more accurate rendering of the human body is developed in art from the last decades of the sixth century.[14] For this thesis, a sound knowledge of human anatomy was acquired and used to analyse closely the rendering of anatomical features and bodily poses. This enabled me to describe the extent to which naturalism was introduced in Late Archaic art, the degree of anatomical knowledge of the artists, and the way they observed their principal subject, the human figure. Several media - vases, sculptures in marble, bronze, and terracotta- were taken into account in order to see the influence of the technique -carving, casting, modelling, and painting- on the rendering of the human body since this is also an aspect frequently ignored in other writings.[15] Several literary sources were referred to. In previous scholarship, ancient accounts of painting, sculpture, and critiques of artists' individual styles were occasionally compared with the material evidence. Here, texts are selected for the information they provide about early experiments in naturalism, and are also used in order to indicate the reactions of Greek and Roman authors, and to complete, as much as possible, our knowledge of the change in style. While scholarship has recently shown an interest in exploring the relationship between the rendering of anatomy

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[13] See, for instance, Richter, G.M.A., Hall, F.H., *Red-figured Athenian Vases in the Metropolitan Museum of Art* (London & New Haven 1936), 39, who note "three long lines for the muscles of the forearm, small arcs at the elbow, the projection of the wrist..."; Beazley, J. D., "Citharoedus", *JHS* 42 (1922) 76: "an arc between the two heads of biceps" for the deltoid impression, examples mentioned by Kurtz, D.C., *The Berlin Painter* (Oxford 1983) 18, note 48.

[14] Many years ago, a monograph attempted a close analysis of the rendering of anatomy in Greek art, but it addressed to students in Fine Arts and was not an archaeological study, Richer, P., *Le nu dans l'art, l'art grec*, vol. 2 (Paris 1926).

[15] Comparison between different media were made in order either to assign dates to those without context (*e.g.* Langlotz, *ZVP*), or to define a regional style (*e.g.* Croissant, *Protomés*).

and the anatomical knowledge displayed in medical texts,[16] it limits itself to medical literature and to an extremely small number of marbles, Roman copies included, [17] dated to the 480s-450s, and exclude other textual and material evidence. In the thesis, texts -"lay", medical and philosophical- about the human body, its anatomy and physiology, are also examined and related to the representation of human anatomy and bodily poses on different media. It is, indeed, likely that the change in the rendering of the human figure reflects a move away from the conventional way of conceiving, and, hence looking at it. Literary testimonia about anatomical knowledge provide information about the perception of the human body in antiquity, and may help to explain the developments which occur in contemporary art.

Although the extant sources have been attributed to people who come from different areas of the Greek world, and philosophers, physicians and artisans travelled widely in Archaic Greece, the thesis deals with material from Attica because that is where abundant archaeological evidence can still be found. A great range of large-scale sculpture and reliefs come from Attic cemeteries, and marbles, bronze and terracotta figurines, have been discovered on the Athenian Acropolis. Attic vase-painting was the major human-figured vase decoration in Greece at that time. It is our main evidence of a two-dimensional representation of the human figure since little contemporary monumental painting has been preserved.

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[16]Leftwich, G.V., "Polykleitos and Hippokratic medicine", *Polykleitos, the Doryphoros and Tradition*, eds. Fowler Hughes, B., Moon, W.G. (Wisconsin 1995) 38-51. Metraux, G., *Sculptors and Physicians in fifth-century Greece. A preliminary Study* (Montreal 1995).

[17] For specific problems related to Roman copies of Greek originals and neglected by Metraux, see Ridgway, *The Severe Style in Greek Sculpture* (Princeton 1970) 56-70.

The study of material starts from the introduction of the red-figure technique in Attic vase-painting, usually dated *ca.* 530-525.[18] The development of this technique coincides with other technical experiments in vase-painting (white-ground, Six technique, coral red) and bronze-casting (the earliest known hollow-cast bronze was dated to this period, and the piece-casting technique was probably introduced around this time),[19] which allow us to examine the influence of new techniques on the rendering of the human figure. The Sack of Athens, during which the Persians destroyed the city and its countryside,[20] provides a historical and material *terminus ante quem.* Although the number of vases is still significant, other archaeological evidence decreases in Attica for the following years. There are no clearly sealed destruction deposits on the Acropolis which may help us to know that a given statue was dedicated after the invasion,[21] but it is clear that only a few marbles are preserved after the 480s. In addition, large-scale bronzes, which become the main medium for free-standing sculpture,[22] were melted down and are known almost exclusively from Roman copies.

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[18] These dates were suggested because of the similarity between the rendering of anatomical features on early red-figure vases and the frieze of the Siphnian Treasury, dated to *ca.* 530-525 from a mention in Herodotus 3. 39-60. Langlotz, *ZVP*, 17-23; and Bothmer von, D., "Andokides the potter and the Andokides Painter", *BMetrMus* 24 (1965-1966) 208-212.

[19]Robertson, M. C., *The Art of Vase-painting in Classical Athens* (Cambridge 1992), 9. About the earliest known Attic life-size bronze, see Mattusch, C.C, "Molds for an Archaic bronze statue from the Athenian Agora", *Archaeology*, 30, no. 5 (1977) 326-332, and about early large-scaled bronzes eadem, *Classical Bronzes. The Art and Craft of Greek and Roman Statuary* (Ithaca & London 1996) 8-24. For the piece-casting process, also see Haynes, D.E.L, *TheTechnique of Greek Bronze Statuary* (Mainz am Rhein 1992) 48-49.

[20] Hdt. 8. 50. 6-7; 53. 14.

[21]Moreover, the records of the 19th century excavations on the Acropolis usually lack information about the stratigraphy and the material of the 5th century pockets, see Bundgaard, J. A., *The Excavations of the Athenian Acropolis* (Copenhagen 1974) 12.

[22] Raubitscheck, A.E., *Dedications from the Athenian Acropolis. A Catalogue of the Inscriptions of the Sixth and Fifth Century B.C.* (Cambridge Mass. 1949) 479.

The thesis follows the conventional chronology for the period between the 520s and 480s since the redating of Francis and Vickers cannot be accepted.[23] Although it is not my purpose to examine the uncertainities of the traditional scheme, the slight fluctuation of "fixed points", such as the dates of the Temple of Apollo and the Treasury of the Athenians, proposed by some scholars is discussed in the relevant chapters.[24] Material without context is dated by quarter-centuries because it seems unwise to assign a date within a decade mainly on stylistic criteria; stylistic development, although steady in general, may vary according to the artist, the technique or medium used, and the place of production. As Robertson notes, although the dates by quarter-centuries are open to the same objections, they have the advantage of appearing less precise.[25] For this reason, material placed slightly earlier than 525 or later than 480 is also considered.

Information on the archaeological evidence was obtained by personal study in museums, and completed by consulting catalogues of collections, reports of excavations, and the photographic collection of the Beazley Archive in Oxford. The catalogue includes vases, marbles, bronzes and terracottas but no coins and gems. Coins are of little help in the study of bodily poses, since Late Archaic Athenian coins displayed the face of Athena on the obverse, and an owl on the reverse, and there are no gems of this date known to us with a secure Attic

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[23]Among their writings see "Signa priscae artis. Eretria and Siphnos", *JHS* 103 (1983) 49-67; Vickers, M., "Early Greek coinage, a reassessment", *NumChron* 145 (1985) 1-44; "The Agora revisited: Athenian chronology, *c.* 500-450", *BSA* 83 (1988) 143-167. For an effective criticism of their work on chronology, Amandry, P., "A propos des monuments de Delphes: question de chronologie", *BCH* 112 (1988) 591-609; Cook, R.M., "The Francis-Vickers chronology", *JHS* 109 (1989) 164-170.

[24]For a lowering of 15 years of the conventional dating: Tölle-Kastenbein, R., "Bemerkungen zur absoluten Chronologie spätarchaischer und frühklassischen Denkmäler Athens" *AA* (1983) 573-584.

provenance. Reference to the material is made in the text as it follows: **B** for bronzes, **S** for sculpture in stone (marbles and poros), **T** for testimonia, **TC** for terracottas, **V** for vases, with their catalogue number. A selection was made among the representations of the human figure in order to include those considered to be the most representative of a growing naturalism, while conventional and coarse representations were also added to provide, as far as possible, a more complete picture of the rendering of the human figure not only on fine, but also, on second-rate works. At the beginning of the thesis, a section defines the main anatomical features which can be seen on the human body and provides clinical terminology to avoid confusion and ensure a clear understanding on the part of the reader.

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[25] Robertson, AVPCA, 41.

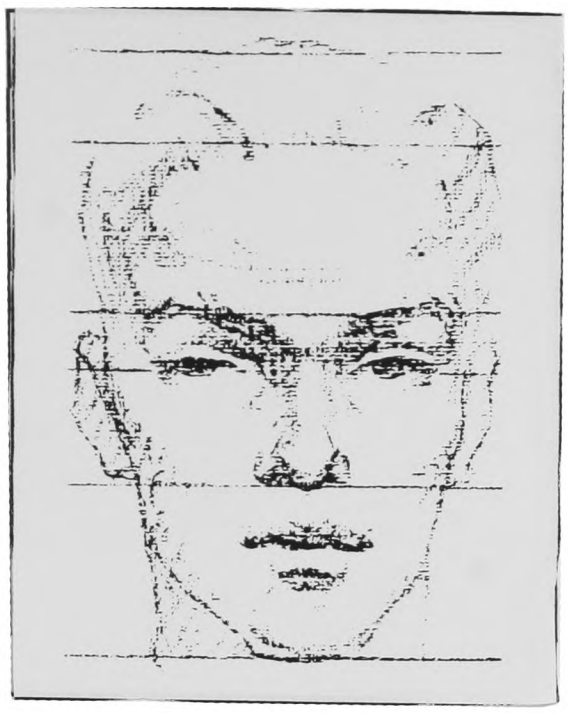
II. SUPERFICIAL ANATOMY OF THE HUMAN BODY

This section examines the anatomical features which shape the surface forms of the human body. In the descriptions which follow, the anatomical position is assumed (body upright, with the palms of both hands directed forward), and anatomical features are mentioned according to their place on the body: anterior (front of the body), posterior (back of the body), superior (towards the head), inferior (towards the feet), medial (near the median line) and lateral (away from the median line). The anterior and posterior views of the hand and feet are respectively named: palmar and dorsal, plantar and dorsal.

The principal movements of the body are: flexion and extension, adduction, and rotation. Pronation and supination describe the movements of the bones of the forearm, inversion and eversion some movements of the feet.

The Head

The head is defined by the ovoid shape of the skull. On its anterior aspect is the face composed of several anatomical features visible on the surface. On the superior area, the forehead is delimited by the hair, the temples (**1**) (composed of the temporal bone and the muscle temporalis), and, inferiorly, by the bridge of the nose and the eyebrows (**2**) (formed by the superciliary arch). The nose continues the forehead medially. Its root is marked by a depression between the eyebrows. It ends in a tip (the apex), on either side of which are the wings of the nose (ala), limited above by a groove (the alar furrow). The base of the nose is pierced by two openings, the nostrils. Below the eyebrows, the eyeball is lodged in the orbital cavity. It is framed by the eyelids, fringed with eyelashes. The part of the eyeball visible



Drawing of the head

between the eyelids consists of a transparent sphere (the cornea) coated in an opaque "white" membrane (the sclera) (**3**). The latter covers the iris, at the center of which, there is a circular aperture, the pupil. The corners of the eyes are named the inner and outer canthus. A small mass, the lacrymal canal (caruncula lacrymalis) marks the internal angle (**4**). Under the lower eyelid, a furrow (the infrapalpebral furrow) arises from the inner canthus and swings across the top of the cheek (**5**). The latter extends from the nose to the opening of the ear, and from the eyes and temples to the chin and the region beneath it. The cheekbone (the zygomatic bone) forms the most prominent point of the cheek (**6**). Laterally, it becomes slightly depressed as it moves to the front of the ear and to the angle of the jaw (formed by the inferior border of the mandibula) and meets the surface of the quadrilateral surface of a muscle (masseter). The upper lip of the mouth is separated from the cheeks by an oblique groove, the nasobial furrow (**7**). The face terminates inferiorly at the chin, the protuberance of which is due to the inferior maxillary bone and to a dense accumulation of fatty tissue (**8**).

On the lateral aspect of the head, there are the temples, and the ears. The temples prolong the forehead laterally. They correspond to the temporal fossae on the skeleton, which is filled by a powerful muscle (temporalis) forming a considerable projection. The ear is separated from the cheek by a small hollow. It is ovoid in shape and displays several reliefs: at the center, the depression of the external auditory passage (the conchea) (**1**), bordered laterally

The ear

by the antihelix (**2**); on either sides of this central depression, there are two small projections, one medially (the tragus) (**3**) and one laterally (the antitragus)(**4**). A fold (the helix) borders the superior and lateral part of the ear (**5**), and terminates in a fleshy mass (the lobe) (**6**). At the superior part of the ear, between the helix and the antihelix, is formed a small depression, the triangular fossa (**7**).

The neck

The neck is the part of the body which supports the head and unites it with the trunk. On its anterior and lateral aspect, two transversal reliefs are formed by the sternocleidomastoid. Divided in two fasciae, one attached to the sternum, another to the clavicle, it leaves a triangular depression medially, the pit of the neck (jugular nodge). The main landmarks of the nape of the neck are the two longitudinal masses of trapezius.

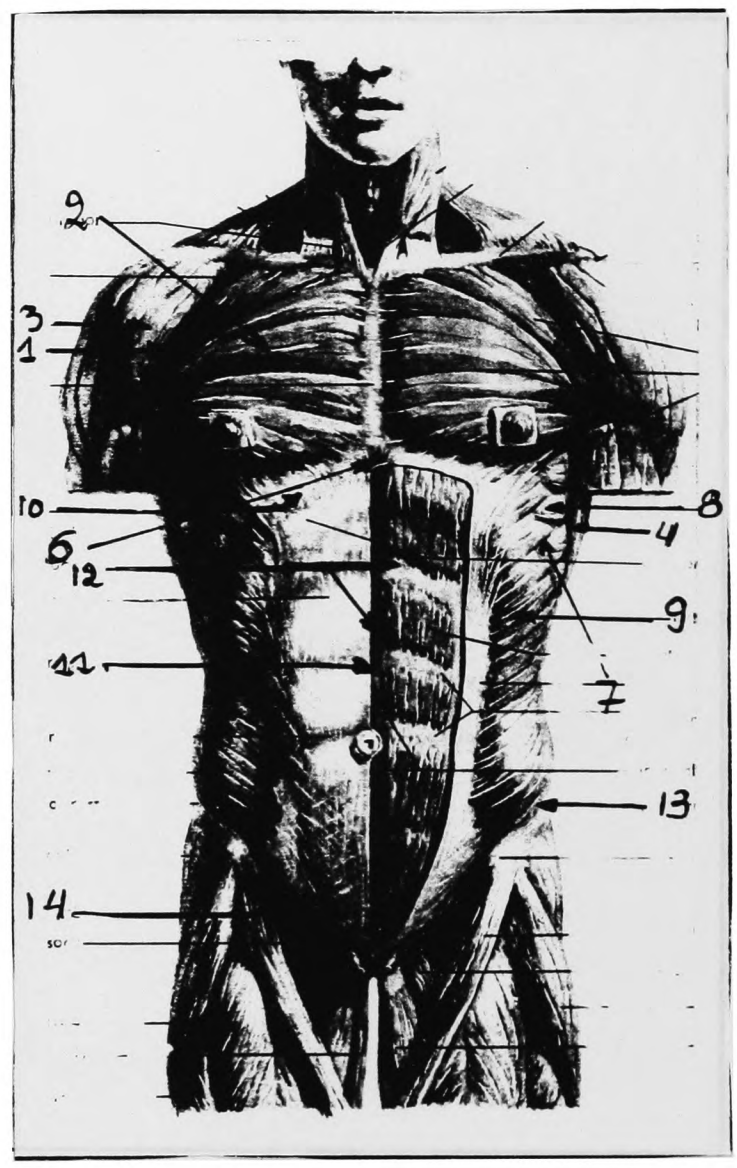
The torso or trunk

i. Anterior and lateral views

The chest occupies the whole anterior part of the thorax. It is bordered superiorly by the clavicles and by the deltoid furrow (**1**), that is an oblique furrow demarcating the pectorals (**2**) from the main muscle of the shoulders (the deltoid) (**3**). The lateral boundary of the chest is marked by a slight swelling, shaped by the anterior border of latissimus dorsi (**4**). Its inferior limit is drawn by the waist, and its medial one by the costal margin. On the chest, the pectorals are developed on either sides of the sternal depression (**5**). The latter rests on the

sternal bone, ending in the xiphoid process, deeply situated, which focuses the pit of the stomach (epigastric depression) (**6**). In women, the breasts, composed of the mammary glands and fatty tissue, shape the inferior and external part of the pectoral region, leaving the superior part free. The breasts face towards the front and slightly outwards, and the nipples lie on the most salient part.

The chest wall is convex because of its muscular bundles which lie directly upon the ribs. A series of angular projections occur on its surface. They appear at the level of the inferior border of the pectorals and are extended to the projection of the anterior border of the main muscle of the back (latissimus dorsi). These interdigitations (**7**) are formed by the insertions of the anterior border of serratus anterior on the lower ribs (**8**), and by those of external oblique on the inferior border of the ribs, both interlocking with each other (**9**). The subcutaneous border of the ribs which is often confused with the muscular interdigitations may be also seen in this region.



Anterior aspect of the trunk (dissection)

The transition between chest and abdomen is made by a semicircular swelling shaped by the insertion of the abdominal muscle in the costal cartilages (following the shape of the

costal margin) (**10**). The superficial muscle of the abdomen (rectus abdominis) is divided in two parts (extending from the pit of the stomach downwards to the pubis), each of equal length on either side of a medial line, created by a fibrous strap (linea alba) (**11**) which disappears a little below the navel. The aponeurotic intersections of rectus abdominis are usually visible on the surface as three transverse divisions, the lowest of which is at the level of the navel (**12**). The region below the navel is occasionally marked by a semicircular cutaneous line. The fullness of the abdominal muscle and that of external oblique laterally, create the lateral line which separates the abdomen from the flanks. The inferior boundary of the abdomen is shaped by a curved line, "the line of the groin", which extends laterally to the anterior border of the iliac bones (**13**).

The flank lies between the lower border of the rib-cage and the iliac crest, and forms the sides of the abdomen. The surface of the flank is always convex and is circumscribed inferiorly by the furrow of the hip which lies anteriorly on the iliac crest.

The pelvis consists of the narrow regions of the pubis and the groin. The pubic region rests on the bone of the same name, it is triangular and covered with the pubic hair (**14**). The region of the groin lies between the abdomen and the thigh. A furrow, created by a ligament, marks its inferior border which runs obliquely from the anterior superior iliac spine to the pubis.

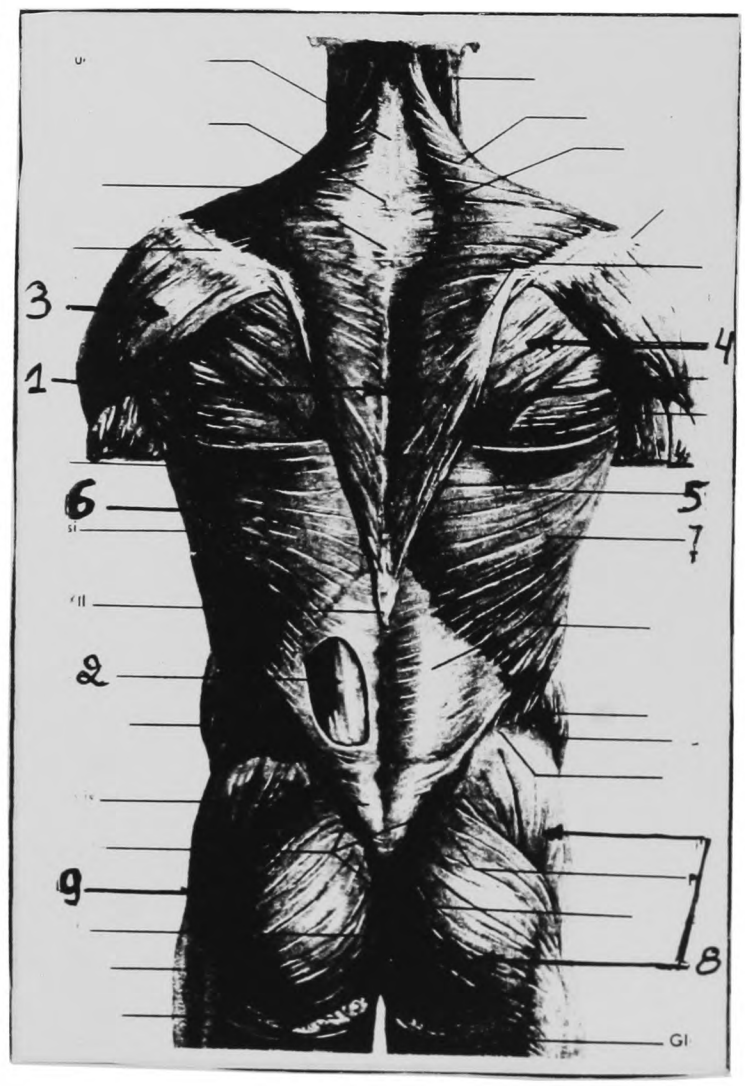
ii. Posterior view

The back consists of the whole posterior part of the thorax. It is traversed from top to bottom by a median vertical furrow coresponding to the subcutaneous border of the vertebral column (erectus spinae) which extends downwards to the loins and disappears in the sacral

region (**1**). Along the vertebral column, the reliefs on the surface are due to deeper muscles, the *rhomboids* superiorly and the spinal muscles inferiorly (**2**). The posterior aspect of the muscle of the shoulder (deltoid) (**3**) and the bony prominence of the shoulder-blades (scapulae) (**4**) form the two main landmarks on the superior area of the back. A semicircular depression (the scapular depression) (**5**), resulting from the insertion of latissimus dorsi in the shoulder-blades, demarcates them medially from the muscles developed along the vertebral column. An oblique furrow may occasionally appear which extends from the inferior angle of the shoulder-blade to the flank laterally. It results from the posterior aspect of serratus anterior which lifts latissimus dorsi (**6**). On very thin subjects, the prominent form of the ribs and the depressed intercostal spaces may be visible.

The region of the loins is lozenge shaped. Its superior limit is formed by a groove which follows an inverse V-form, is shaped either by the fleshy fibres of latissimus dorsi (**7**), or by the slight development of spinal muscles. The inferior limit consists of a V-form depression caused by the buttocks, and their gluteal muscles (**8**).

On the posterior aspect of the flank, which lies between waist and hips, the fatty layer is often thickened. In the female body, this fatty



Posterior aspect of the trunk (dissection)

pad hides the divisions between the flank and the buttocks in such a way that the buttocks seem to rise as far as the line of the waist.

The buttocks project more on their inferior median area shaped by the rounded form of gluteus maximus. Their lateral boundary is defined by an oblique depression (the depression of the great trochanter) (**9**). This landmark is more visible on the profile view and is due to the bony prominence (great trochanter) at the upper end of the femur (thigh bone) which gives width to the hips and is the point of intersection of powerful muscles controlling the action of the lower limbs. The inferior fold of the buttocks fades away laterally, while it is attached medially to the deeper parts of the body (to the femoral aponeurosis, which inserts into the ischium), and is closely connected with the pelvis. As a result, when the weight is on one side, the fold of the buttock will be deeply creased on the standing side.

The Upper Limbs

The rounded form of the shoulder is given by its single muscle the deltoid (**1**) which inserts into the bone (humerus) of the upper arm and creates an oblique furrow (**2**) between itself and the two main muscles of the upper arm. [1]

The anterior part of the upper arm is shaped by the elongated relief of biceps brachii, which takes a globular form when it is contracted (**3**). The posterior part is shaped by triceps (**4**). When the latter is relaxed, the form is full and rounded, but when it is contracted, the various parts of the muscle are very clear. Two veins mount the upper arm: the basilic, medially, and the cephalic, laterally, which rises along the lateral border of the biceps until it

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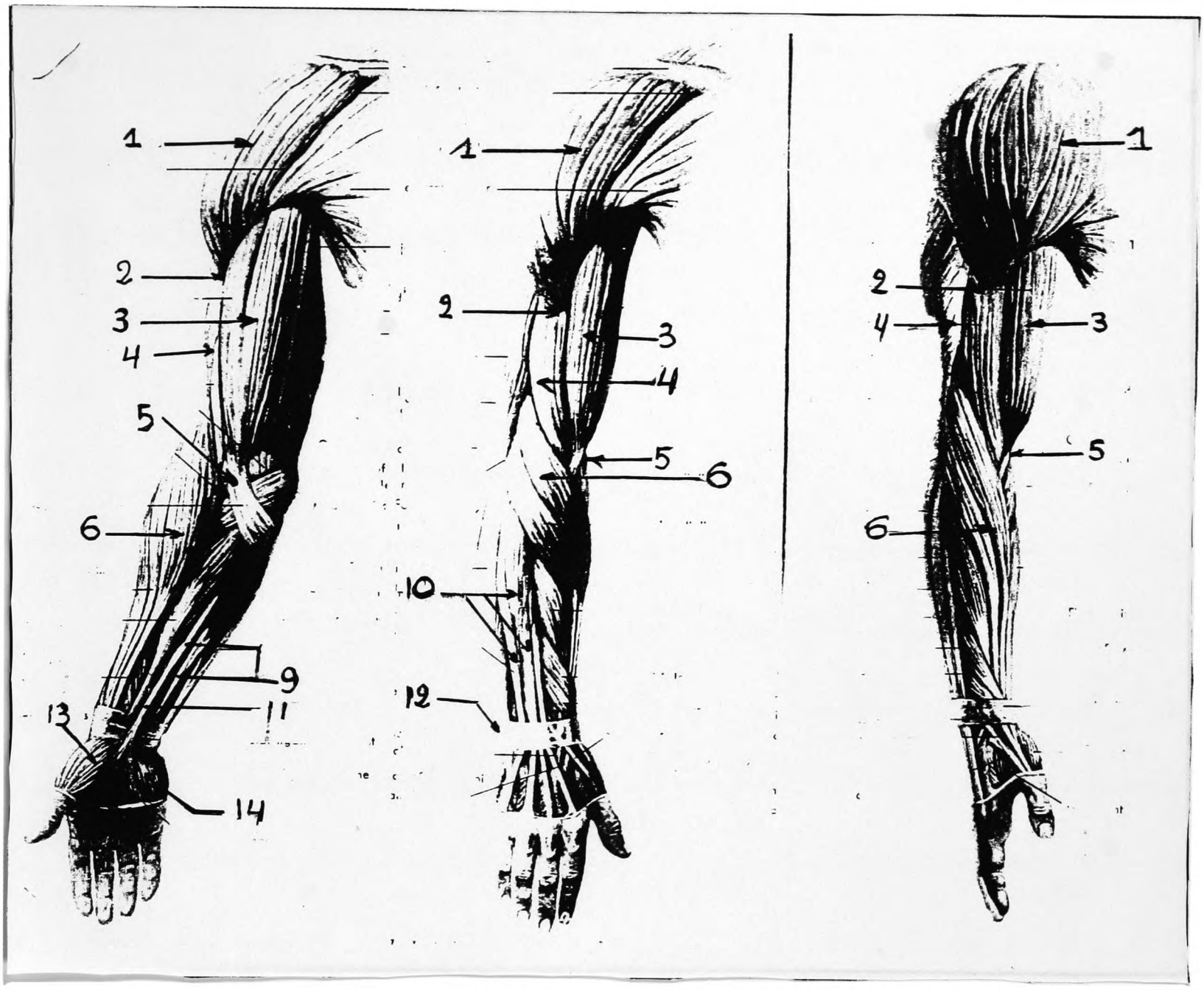
[1] As far as anatomy is concerned, the region of the shoulder-blade belongs to the arm but, from the point of view of morphology, it belongs to the trunk and that is why it was

reaches the deltoid furrow.



Upper limb, dissection: in supination (a), in pronation (b), in demi-pronation (c)

The anterior part of the elbow is known as the bend of the arm (**5**). On it, three muscular reliefs may be seen. One, median and superior, is formed by the inferior extremity of biceps. Another (formed by the superior extremity of pronator teres), rounded and elevated, surrounds the median tendon of biceps and extends further down. The third is posteriorly situated, and is created by the main muscle of the forearm, brachioradialis (**6**). The veins which occur on the anterior aspect of the elbow follow an M-form, the central "V" of which is

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included in this section.

formed by the median cephalic, laterally, and the median basilic, medially. The region is also marked by several wrinkles. A bony prominence occurs on the posterior view of the elbow shaped by the projection of the bone of the forearm (the olecranon process of ulna) (**7**). It is surmounted by a transverse fold and bordered by a depression laterally (caused by extensor carpi radialis longus) and medially (caused by the medial epocondyle).

The anterior aspect of the forearm is flat. On its superior portion, there are two muscular reliefs. The external one is the fleshy body of brachioradialis; the medial one created by a group of muscles which form distinct masses (pronator teres, and a second swelling due to the flexor muscles) (**8**). The anterior or palmar aspect of the forearm narrows at its inferior part which is traversed by tendons (**9**). The posterior aspect of the forearm is divided in two parts by the crest of a bone (the ulna) which occurs as a furrow because of the reliefs of the adjacent muscles. On the forearm's latero-posterior side, these muscles cut it obliquely from above to below and from the lateral to the medial side, and become more distinct when the hand is forcefully extended (they are extensor carpi ulnaris, extensor digitorum, extensor digiti minimi) (**10**). Veins cross the forearm obliquely, go up the posterior surface of the wrist to the anterior surface of the elbow: the radial and cephalic laterally, and the basilic medially.

The wrist is situated berween the forearm and the hand. Its palmar surface is crossed by slightly oblique wrinkles, often three in number. Besides theses wrinkles, the most notable landmarkss are the longitudinal cords formed by tendons (palmaris longus and flexor carpi radialis) (**11**). On the dorsal aspect of the wrist, occurs the bony projection of the styloid process of the ulna (**12**).

The palm (or anterior aspect) of the hand is bordered by several eminences of varying

shape and volume. The most prominent corresponds to the base of the thumb (thenar eminence) and is encircled by a long curved line (the line of the thumb) (**13**). At the median side of the hand, a group of muscles form the hypothenar eminence which extends along the whole length of the hand (**14**). The palm of the hand is crossed by a few wrinkles. The dorsal surface of the hand reproduces the general convex form of its skeleton. The most prominent part corresponds to the metacarpals. Tendons and veins which diverge from the center of the wrist towards each finger are visible on the surface. The fingers are irregularly cylindrical, and all of them have three phalanges except the thumb which has two. The posterior aspect of the fingers correspond almost exactly to the bony phalanges. They are marked at the joints by transverse wrinkles which create an ellipse. The palmar surface of each finger is divided in three parts by wrinkles.

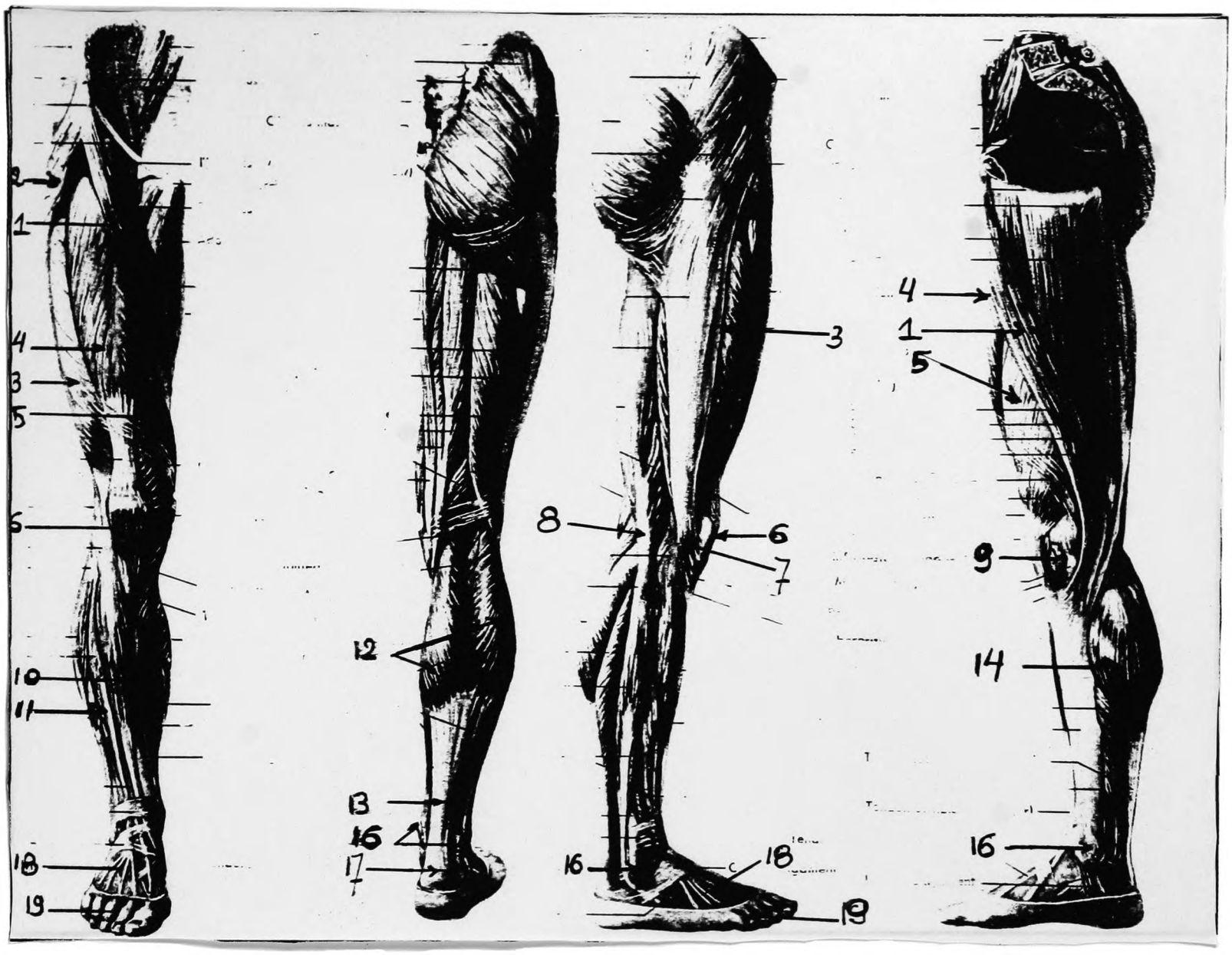
The Lower Limbs

The thigh is formed by three muscular masses visible on the surface: the quadriceps (anteriorly), the adductors (medially) and the hamstring group (posteriorly). The quadriceps is limited medially by the oblique furrow of sartorius (**1**). The latter starts from a depression superiorly, usually referred as the femoral depression, which is caused by the separation of two muscles, sartorius and tensor fascia lata (**2**). The quadriceps is formed by three muscles (vastus lateralis, rectus femoris, vastus medialis). An elongated mass is shaped laterally by vastus lateralis which starts beneath the depression of the great trochanter and descends to the knee (**3**). In the middle of the thigh, rectus femoris forms a distinct relief when it is contracted (**4**). A third ovoid mass descends as far as the middle of the knee, which is shaped by vastus medialis (**5**). The posterior surface of the thigh is rounded and no particular muscle stands out

from the hamstring group.

The knee corresponds to the articulation of the femur and the tibia and constitutes a quadrangular mass in front of which projects the patella (**6**). On its lateral surface occur two prominences on either side of a furrow. The anterior one (the tibial fascia of the femoral aponeurosis) is flattened and terminates in the external tuberosity of the tibia (**7**). The posterior is rounded and larger; it is formed by the tendon of biceps femoris and descends to the back of the knee (below the head of the fibula) (**8**). The medial (or internal) surface of the knee is divided into two equal parts by a furrow (which runs along the anterior border of sartorius). Further to the front, there are the prominences of the internal angle of the patella, and its fatty cushion (**9**). The back of the knee is concave in flexion, and forms a longitudinal relief in extension. Two furrows border this median relief. The lateral one is the deepest. It extends below the head of the fibula, following the tendon of biceps femoris. The medial one curves towards the knee. A deep wrinkle appears on the back of the knee, formed by the flexion movement.

On the anterior aspect of the lower leg, the subcutanous border of the tibia shapes the medial surface of the lower leg throughout its whole length (**10**). On the antero-lateral side, a convex mass is formed by three muscles (tibialis anterior, extensors, and peroneals) (**11**). The main relief on the posterior aspect of the lower leg is the calf. The heads of its main muscle (gastrocnemius) form two longitudinal prominences on each side of a median line (**12**). The medial head is larger and descends lower than the lateral. Beneath the calf, the heel tendon (tendo calcaneus) becomes narrower as it descends (**13**). On the medial aspect of the lower leg, two masses are formed by the medial head of gastrocnemius (**14**) and the internal border of



Lower limb, dissection: anterior (a), posterior (b), lateral (c) and medial (d) aspects

soleus (**15**).

The ankle forms the junction of the lower leg and the foot. On either side, a prominent relief is formed by the ankle bones (malleola) (**16**). The medial one is situated well to the front, while the lateral is narrower, lower, and occupies the middle of the region. The ankle has a rounded surface on its anterior aspect, with one visible (that of tibialis anterior) which descends obliquely to the feet (to the first metarsal). In the posterior aspect of the ankle, the heel tendon (tendo calcaneus) forms a strong relief (**17**).

The foot is divided in two parts: the vault of the foot (**18**) and the toes (**19**). The skeleton dominates the general form of the vault. It is arched medially, and depressed laterally. The dorsal (or anterior) view of the foot has a rounded surface. It is traversed by a number of

tendons and veins (particularly the venous arcade of the metatarsals). The sole of the foot is composed of the hollow of the vault which opens medially, and of a thick cushion which stretches under the articulations (metatarsophalangeal) of the toes. The toes, apart from the big one, have all the characteristics of the fingers although they are more rounded, smaller and their tip is larger so as to rest on the ground. The big toe is slightly inclined to the inside, towards the medial axis of the foot. The second and third toes are more or less parallel to the first. The fifth follows an inverse direction. As for the fourth, its direction may vary, sometimes parallel to the third, sometimes to the fifth. Like the fingers, the toes are of unequal length, sometimes the big toe is the longest; sometimes the second. The dorsal surface of the toes is rounded and wrinkles mark the joints.

III. ANCIENT SOURCES

Section A presents ancient texts which describe the rendering of anatomy and poses of the human figure in Greek art until the 480s, and analyzes some Greek and Latin terms in order to gain a more precise understanding of their meaning. It also examines the nature and reliability of ancient accounts of art.

Section B surveys the literary evidence for Greek anatomical knowledge until the 480s. It investigates Archaic literature and the few preserved "medical" texts. The common and scientific terms used in these writings to define anatomical features are also studied, since they may help to define the extent of anatomical knowledge in the Archaic period .

The passages to which section A refers, and a glossary of the anatomical terms mentioned in Archaic Greek literature, are provided at the end of chapter III. Reference to these passages is made by a capital **T** combined with their number in the *Testimonia;* reference to the anatomical terms is made according to their number in the glossary.

A. On the rendering of anatomy and poses in Greek art until the 480s

Ancient testimonia on Greek art do not refer to anatomy *per se*. However, they often describe the rendering of emotion, the style of painters and sculptors, and their achievements of a more naturalistic rendering of the human body and face. Since personal style and stylistic developments partly depend on the rendering of anatomical features, the texts which mention them have been included.

According to the extant texts, an interest in depicting contemporary famous men and women (kings, generals, poets, victorious athletes) occurs from the second half of the sixth century. Theodoros of Samos (550-520)[1] made a statue of himself (**T1**), the thrice victorious athletes dedicated statues of themselves (**T2**),[2] the image of Hipponax by Bupalos and Athenis suggested the great ugliness of the poet (**T3**) (541-540),[3] Antenor, and later Kritios and Nesiotes (477-476),[4] made the statues of the Tyrannicides (**T4**) (509).[5] We know of a painting portraying Darius, on his throne, crossing the Bosphorus after the first Persian expedition in Europe (519) (**T5**),[6] of the painted images of the girls victorious in the Olympian games and dedicated to Hera (**T6**),[7] and that of a young man made by his lover (**T7**).

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[1]Theodoros worked with Rhoikos in the temple of Hera at Samos (*ca.* 560) (Plin., *HN* 34.83), and toward the end of his career made a ring for Polykrates of Samos who died in the 520s (Paus. 8.14.8).

[2]Pausanias assigns different dates to the earliest statues of victorious athletes. In 6.18.7, he mentions the first portraits of athletes in Olympia as those of Praxidamas and Rhexibios, in the 59th and 61st Ol. (544 and 536), in 6. 15. 8 those of two others victorious in the 38th Ol. (628), and in 8.40.1. that of Arrhachion, victorious in the Ol. which preceeds the 54th (564) (**T22**).

[3]Date provided by Pliny (**T3**), and the *Marmor Parium*, 58 (Jacoby).

[4]*Marmor Parium* 54 (Jacoby).

[5]According to Pliny, *HN* 34. 17: "... the very year in which the kings were expelled from Rome"(510-509). Summary of the discussion on the date of the Antenor's group, see Taylor, M. W., *The Tyrant Slayers: the Heroic Image in the Fifth century B.C. Athenian Art and Politics* (Salem. New Hampshire 1991) 12-15.

[6]According to the Bisitun Inscription, see Petit, Th., "La réforme impériale et l'expédition de Darius Ier. Essai de datation", *AntCl* 53 (1984) 35-46.

[7]According to Scanlon, T.F., "Virgineum gymnasium. Spartan females and early Greek athletes", *The Archaeology of the Olympics*, ed. Raschke, W. (Madison 1988) 186, the Heraia were introduced around the 580s under the influence of the female Spartan games, but there is

It is not clear whether these representations were true to the actual appearance of the figures. As regards the statues of victorious athletes, Pliny attaches the term *similitudo*, which usually defines the realistic quality of a portrait,[8] to the whole body rather than to the face alone (*ex membris ipsorum similitudine expressa, quas iconicas vocant*). This probably means that athletes were portrayed in the athletic activity for which they won a prize, and which helped identify them.[9] The Tyrant-slayers group by Antenor, and that by Kritios and Nesiotes, would seem not to have been portrait-sculpture but rather an idealized representation of Harmodios and Aristogeiton since the preserved Roman statues, considered to be the copies of the Greek Tyrannicides, do not display individualized features.[10] In paintings, the figures were not praised for their likeness to the models in (**T5, T6**) and were probably identified by inscriptions according to a common use in Archaic times,[11] while that

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no literary evidence which provides us with a specific date.

[8]Pollitt, J.J., *Ancient View of Greek Art: Criticism, History, and Terminology* (New Haven & London 1974) 185.

[9]See Bianchi-Bandinelli,R., "Ritratto", *EAA* 6, 705.

[10]A Roman head in the British Museum was sometimes considered a copy of Antenor's Harmodios, although Antenor's group is not securely identified with any Roman copy. London, British Museum 2728, see Robertson, C.M, *History of Greek Art* (Cambridge 1975), 186; Dörig, J., "La tête Webb, l'Harmodios d'Anténor et le problème des copies romaines d'après les chefs-d'oeuvres archaïques" *AntK* 12 (1969) 41-50. On the group of Kritios and Nesiotes, see Brunnsåker, S, *The Tyrant-slayers of Kritios and Nesiotes. A Critical Study of the Sources and Restorations* (Stockholm 1971). For a discussion of the appearance of both groups, see, among the Baiae casts, some fragmentary moulds made directly from the Tyrant-slayers group, Landwehr, Chr., *Die antike Gipsabgüsse: griechische Bronzestatuen in Abgüssen römischer Zeit* (Berlin 1985), 27-47.

[11]Arist., *Top.* 6. 2. 140a 20; Ael., *V.H.* 10.10.

by Butades' daughter (**T7**) is merely a drawing of the contour of the face of her lover.

Two passages laid emphasis on the aspect of the statue. The work of Theodoros is commended for its *similitudo* to the model (**T1**). It is possible that Theodoros attempted to make a statue which slightly departs from a common idealised type, since he was also famous for experimenting in other areas: the introduction of a new technique of bronze-casting,[12] and a treatise on architecture.[13] Yet, the idea of a self-portrait resembling its model must be the invention of Xenokrates who was one of Pliny's sources for Book 34.[14] Xenokrates praises *mimesis* in the works of art and probably over-emphasises the naturalistic aspect of the statue, in order to justify its renown in antiquity.[15] We are also told that the Hipponax of Bupalos and Athenis suggested the ugliness of the poet, and that the latter, in response, composed a satire on the sculptors (**T3**).[16] Pliny's passage is probably reliable since the rest of the information he provides on these three figures is confirmed by epigraphical and literary evidence. An Archaic statue-base, discovered in Delos and signed by Bupalos and Athenis,

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[12]Paus. 8. 14. 8.

[13]Vitr. 8. praef.12.

[14]Mentioned by Pliny as one of his sources in the *Indices* of Book 34. The study of Schweitzer, B., "Xenokrates von Athen, Beiträger zur Geschichte der antiken Kunstforschung und Kunstanschauung", *Zur Kunst der Antike* I (Tübingen 1963) 105-164 is still valuable. For the transmission of elements from the Xenokratic treatise to Pliny's *Natural History*, see more recently, with earlier bibliography, Naas, V., "L'art grec dans l'Histoire Naturelle de Pline l'Ancien" *Revue d'Histoire de l'Art*, 35/36 (1996) 17.

[15]See also Santerre, H., Le Bonniec, H., *Pline, Histoire Naturelle, Livre 34* (Paris 1953), 264, note 2.

[16]Plin., *HN* 36. 13

records a genealogy similar to that quoted by Pliny.[17] The quarrel between Hipponax, Bupalos and Athenis is also mentioned in some fragments assigned to Hipponax himself.[18] Pliny, however, does not focus on the likeness of the statue to the original, but rather states that it suggests his ugliness. It is not a portrait but a caricature. It displays abnormal and ugly features which, like those of the statue by Theodoros, depart from the common idealized type of face.

According to the extant texts, there are only random attempts to portray contemporary individuals during the sixth century, whereas a deliberate interest is mentioned in paintings dating from the second quarter of the fifth century. In Athens, the Persian commanders (Datis and Artaphernes) and famous Greeks participants (Kynegiros, Epizelos, Kallimachos, and Miltiades) are represented in a painting of the Battle of Marathon, which decorated the Stoa Poikile (*ca.* 470-460).[19] In the same building, Sophokles is portrayed

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[17]Mikkiades, was the grandfather of Archermos, who was the father of Bupalos and Athenis, see Marcadé, J., *Recueil des signatures de sculpteurs grecs*, vol. 2 (Paris 1957), 27, and Plin., *HN* 36. 11-12.

[18]Although the fragments do not mention the cause of the dispute, the name of Bupalos is combined with insulting adjectives in F1,2; 12,2; 15; 77,4; 79, 12; 84, 18; 95, 15, (*IEG*, vol. 1) and that of Athenis in F1,2; 70, 11 (*IEG,* vol. 1).

[19]An accurate date cannot be assigned to the Stoa Poikile. We know that its early name was *Peisianakteion*, according to its founder, Peisianax (DL 8. 1. 5; Suid., s.v. *Peisianakteion*), often identified with the uncle of Isodike, the wife of Kimon. Because of the close relation between Peisianax and Kimon, the building is usually dated between 473 (Kimon's arrival in Athens) and 461 (Kimon's ostracism), see *Recueil Milliet*, 136, note 1, and Coulton, J.J., *The Architectural Development of the Greek Stoa* (Oxford 1976) 40. The pottery associated with its construction is dated to 475-450, Camp, J., *The Athenian Agora*[4] (Athens 1990) 101-109.

performing on his kithara in the Thamyris.[20] Although the likeness of these figures to their models cannot be demonstrated,[21] the preserved literary testimonia suggest that, during the same period, the painter, Polygnotos of Thasos (475-420), experimented with a more naturalistic rendering of the face. He appears to have combined expressive and, in some way, individualized features with an idealized face.[22] His works, praised by Aristotle who tells us that "Polygnotos painted men better than they are" (**T8**), probably reflect the philosopher's definition of the portrait, according to which, a good portrait-maker, although reproducing the likeness of the model, improves on it.[23] The original character of Polygnotos' work is confirmed by different literary sources which do not depend on each other. According to Plutarch, he transposed the facial features of his mistress, Elpinike, to Laodike, a Trojan woman, whom he painted in the Stoa Poikile (ποιῆσαι πρόσωπον ἐν εἰκόνι τῆς Ἐλπινίκης) (**T9**). Although in this passage, Plutarch reports information of which he had no personal knowledge ("it is said that...", "φάσιν"),[24] the interest shown by Polygnotos in

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[20]Philostr. *VS* 5 (Westirmann). *Recueil Milliet*, 139 note 2. Wicherley, R.E., *Literary and Epigraphical Testimonia, The Athenian Agora* 3 (Princeton 1957), 42-43, no. 90.

[21]This question has been debated at great length, *e.g.* Metzler, D., *Porträt und Gesellschaft* (Münster 1971) 352 (close to portraits). Bianchi-Bandinelli, *EAA* 6, 707 (not portraits). Gauer, W.,"Die griechischen Bildnisse der klassischen Zeit", *JdI* 83 (1968) 139 (figures were not portraits but identified by their pose).

[22]See for the combination of both trends, idealizing and naturalistic, by Polygnotos, Rouveret, A., *Histoire et Imaginaire de la peinture ancienne: Ve siècle av. J.C.-Ier siècle ap. J.C.* (Rome 1989), 137, 152-153.

[23]Arist., *Poe.* 1454 b8.

[24]See Plutarque, *Vies, Cimon, Lucullus, Nicias, Crassus*. ed. & tr. Flacelière, R., Chambry, E. (Paris 1972), 10.

depicting figures which may depart from a common type, is further confirmed by Pausanias who saw his paintings in Delphi and Athens.[25] He credits Polygnotos with a figure which is recognisable without the help of the inscription (**T10**), and with other figures which suggest fear, humiliation, and pain through their poses (**T10, T11**). His interest in the rendering of emotion is mentioned in other texts. Pliny considers him to have been the first to portray figures with an open mouth, and bared teeth, and to vary the expression of the faces (**T12**).[26] An epigram from the Greek Anthology (**T13**) describes the Polyxena of Polygnotos as "showing the horror of war in her gaze", and Aristotle refers to him as "a good painter of characters" (ἀγαθὸς ἠθογράφος) (**T14**).[27]

As regards the representation of the human body, ancient testimonia emphasize the preoccupation of sculptors from the middle of the sixth century with problems of proportion and symmetry . In an anecdote about Theodoros and Telecles of Samos (**T15**), Diodoros explains that Greeks build up statues according to a module of proportions (συμμετρία) which they deduce from "the appearances that are presented to the eyes" (ἀπὸ τῆς κατὰ τὴν ὄρασιν φαντασίας τὴν συμμετρίαν τῶν ἀγαλματῶν κρίνεσθαι), while the

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[25]Where the descriptions are not from direct observations, Pausanias mentions it in his text, *e. g.* 1. 38. 2; 8. 10. 2. See Arafat, K., *Pausanias' Greece. Ancient Art and Roman Rulers* (Cambridge 1996) 17.

[26]On the use of *primus inventor* by Greek and Roman authors on different topics, see, still valuable, Kleingünther, A., " *Πρῶτος Εὑρετῆς*. Untersuchungen zur Geschichte einer Fragestellung" *Philologus*, suppl. 26 (1934) 1-155, and for Pliny's use, Isager, J., *Pliny on Art and Society. The Elder Pliny's Chapters on the History of Art* (Odense 1991) 36.

[27]For the term *ethos* applied by Aristotle to Polygnotos of Thasos, see Pollitt,"The ethos of Polygnotos and Aristoteles", *In Memoriam Otto J. Brendel. Essay in Archaeology and the Humanities* (Mainz 1976), 53, and Rouveret, *Peinture et Imaginaire*, 129-133.

Egyptians have a theoretical module which they apply when they have laid out the stones, divided them and begun to work them. Following the Egyptian method, Theodoros and Telekles made the statue of Apollo in Samos in two parts, each sculptor working on one part, which was then fitted to the other (**T15**). Although this passage indicates that Greek method of calculating proportions is more naturalistic,[28] it also shows that Greeks follow a theoretical module of proportions to reproduce the human body, and a symmetrical display of anatomical features on either side of a medial vertical line through the body. This interest in proportion and symmetry is carried on by Pythagoras of Rhegion (480-470),[29] who "aimed at *rhythmos and symmetria*" (**T16**), and may be considered as the predecessor of Polykleitos and his *Kanon*.[30] Commentaries on Greek statuary dated to the first half of the fifth century suggest that it displayed a symmetrical and geometrical rendering of anatomy. Cicero, who is occasionally interested in *mimesis*,[31] tells us that the sculpture of Kanachos (500-480) was

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[28]Although Telekles and Theodoros applied an Egyptian method as opposed to a Greek one in this passage (see Ridgway, B.S., "Greek kouroi and Egyptian methods" *AJA* 70 (1966) 68-70), Diodoros tells us in another passage (**T21**) that early Greek statuary follows Egyptian's methods and shapes, and hence we must not overemphasize the differences outlined here.

[29]Dates are suggested by bronzes of victorious athletes in Olympia: Astylos, victorious in Ol. 73-75 (488-480) (Plin., *HN* 34. 59; Paus. 6. 13. 1), Euthymos Ol. 74-77 (484-476-472), (Paus. 6.6.4-6), see Stuart Jones, H., *Select Passages from ancient Writers. Illustrations of the History of Greek Sculpture* (Chicago 1966) 55.

[30]Hurwitt, "The Doryphoros looking backwards", *Polykleitos* (1995) 9-10.

[31]Although, like Quintilian and Dionysius of Halicarnassus, Cicero, in his brief accounts of art, usually praises *phantasia*, the ability to perceive and give form to the majesty of the Gods, see Teyssier, M.L., "Cicéron et les arts plastiques. Peinture et sculpture" *Caesarodunum* 19bis (1984) 67-76.

"too rigid than it should be in order to imitate nature" (**T17**).[32] Lucian when explaining the attributes of a good speech uses the analogy of sculpture, and makes the works of Kritios and Nesiotes (active at the latest, from the 480s)[33] which he describes as "closely knit and sinewy, stiff and linear" (**T18**) the models of a good speech. Although these works were praised or disdained according to the commentators' own aesthetic and philosophical values, the descriptions must reflect the sculptors' style since some of their statues were still visible until the second century A.D., and both writers may have seen the originals or copies of them in Rome.[34]

The preserved literary testimonia occasionally mention the development of some anatomical features in Greek art although they do not provide detailed descriptions of anatomy. According to Pliny, Eumares of Athens was "the first to distinguish males from females in painting" (**T19**). He also credits the painter Kimon of Kleonai with the rendering of "joints and emphasized veins" (**T19**),[35] and the sculptor Pythagoras of Rhegion with the

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[32]Cic., *Brut.* 70. Kanachos' dates are deduced from the statue he made for the Temple of Apollo of Branchidai (Plin., *HN* 34. 75) which was destroyed by Darius in 493 (Hdt 6. 19), and from his association with Kallon of Aigina (Paus. 7. 18. 10) whose name was found on a base dated to the end of the sixth century (Athens, Epigraphical Museum 6257, *DAA*, no 85). For Kallon's dates see Walter-Karydi, *Alt-Ägina*, II, 2, 13-18.

[33]They made the statues of the Tyrannicides in 477 (*Marmor Parium* 54 [Jacoby]) to replace those made by Antenor and taken by the Persians (Paus. 1. 8. 5, and Plin., *HN*. 34. 69-70).

[34]Still visible: Works of Kanachos, at Thebes (Paus. 9. 10. 2), at Sikyon (Paus. 2. 10. 4.); of Kritios and Nesiotes, in Athens (Paus. 1. 8. 5.), and for copies of Greek originals described by Lucian and seen in Rome, see Ridgway, B.S., *Roman Copies of Greek Sculpture* (Ann. Arbor 1984), 65.

[35]The date is roughly suggested by an epigram attributed to the poet Simonides (540-

"development of veins and with a skilful rendering of hair" (**T20**). Eumares has been identified with the man who has his name on three statue-bases from the Akropolis,[36] and who is Antenor's father.[37] According to these epigraphical and genealogical criteria, he was active during the second half of the sixth century.[38] An epigram of Simonides refers to a painter Kimon as a co-worker with another painter named Dionysius, probably Dionysius of Kolophon, a contemporary of Polygnotos of Thasos.[39] If Kimon of Kleonai may be identified with that man, his career partly overlapped with that of Polygnotos and can be dated to the first half of the fifth century. He must be, hence, a contemporary of Pythagoras of Rhegion. Although all these artists have been identified by literary or epigraphical evidence, it is difficult to reconstruct the innovations assigned to them by Pliny. It is not clear whether Eumares' experiments reflect the Archaic convention of representing the skin of men in a dark colour and that of women in a light one,[40] or a more naturalistic rendering of the female and male anatomy and bodily proportions. In fact, he probably attempted to distinguish male and female anatomy since his concern for a more naturalistic rendering of the human figure is

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470) which mentions a painter Kimon, *Anthologia Graeca* 9.758.

[36]*DAA* nos 51, 108, 197.

[37]*Recueil Milliet*, 76, note 1.

[38]*DAA*, nos 51, 108, 197 and p. 244.

[39]*Anthologia Graeca* 9. 758. See Pollitt, *The Art of Greece, 1400-31 B.C.: Sources and Documents* (Englewood Cliffs. New Jersey 1965) 36; and commentary by Croisille, Plin., *NH* 35, 173, note 4.

[40]See more recently, Williams, D.J.R., "The drawing of the human figure on early red-figure vases", *New Perspectives in early Greek Art* (Washington 1991), 297.

further confirmed by his interest in "every sort of figures" which may be understood as "figures in every sort of poses" **(T19)**. With Kimon and Pythagoras, Pliny does not specify which joints and veins are suggested, and how Kimon "outlines" (*distinxit*) the joints or Pythagoras improves the rendering of hair (*expressit capillumque diligentius*). Although these stylistic developments may indeed have occurred in Greek art from the turn of the sixth century, Pliny's descriptions follow a scheme which underlies his discussions on art. In several passages, he wrote his accounts of art according to a theoretical progression of achievements towards a more naturalistic rendering in painting, marbles and bronzes,[41] and mentions several "inventors" who gradually introduced the improvements towards the perfection, which is the *mimesis* of nature.[42]

As regards bodily poses, several passages refer to the motionless kouros' stance which is common in Greek statuary through the Archaic period. Diodorus Siculus writes that Greek statues had a form similar to that of statues in Egypt **(T15, T21)** which have both legs extended and arms hanging laterally.[43] Pausanias describes a statue of an athlete, Arrhachion, dated to the early sixth century,[44] standing at rest with upper limbs hanging down by the sides as far as the buttocks **(T22)**. In the extant texts, the development of motion is related to

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[41]See the introduction and commentary of Croisille in Pliny, *Histoire Naturelle* 35 (Paris 1985) 21.

[42]For sculpture, *HN* 34. 53-65; and painting, *HN* 35, 53-68; Sellers, *Pliny's Chapters on Art*, xx, xxvii.

[43] For the meaning of in this text, see Pollitt, *Ancient View*, 133, 4.

[44]Before 564-561. He gained two Olympic victories in the Olympiads which preceeded the 54th Olympiad (564-561) (Paus. 8. 40. 1).

athletic statuary. Although without giving dates, Pliny writes that athletes who were thrice victorious were portrayed following the pose of their limbs, probably in an attitude which recalls the athletic activity for which they won a prize (**T2**). For the years after the Persian Wars, texts name specific sculptors who were interested in the rendering of motion. Pausanias reports that a boxer, Glaukos of Karystos, was represented boxing (**T23**) by Glaukias of Aegina.[45] According to Diogenes Laertius, Pythagoras aimed at *ῥυθμός* translated by modern scholarship as the basic rests (ἠρεμίαι) which build up any movement (**T16**).[46] An epigram from the Greek Anthology, notes that Myron suggests extended tendons on the bronze-statue of the runner, Ladas (**T24**).[47] In painting, the introduction of more lifelike poses is attributed to Eumares of Athens, who, according to Pliny, imitates every sort of figure, and to Kimon of Kleonai, who invented the *katagrapha*, or *obliquae imagines*, and dared to represent figures in different ways: looking backwards, upwards, and downwards (**T19**). The term "*figuras*" used to describe the invention of Eumares has been occasionally translated by "figures".[48] It seems, however, that it refers to the poses of the human body since the same

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[45]Active, at the latest, during the second quarter of the fifth century, he also made the statue of Theagenes of Thasos, victorious in the Ol. 75 and 76 (480-476) (Paus. 5. 2. 2), and Philon of Corcyra who had an epitaph made by Simonides (Paus. 6. 9. 9). See Stuart-Jones, *Select Passages*, 48-49, and Walter-Karydi, *Alt-Ägina*, II, 2, 35-39, who dates his works to 500-470.

[46] *ῥυθμός* see Pollitt, *Ancient View*, 141-142.

[47]According to Pliny (*HN* 34, 57), Myron was the pupil of (H)ageladas whose dates (490-470) are determined by his statues of Olympic victors. He also had a son who carved a dedication at the Propylaea after the reduction of Euboea, after its revolt (446).Given this, he must have been active around the second quarter of the fifth century.

[48]Jex-Blake, J., Sellers, E., *The Elder Pliny's Chapters on the History of Art* (London

word, also applied to statues, appears in a text of Cicero and was explained by a commentator, the Pseudo-Asconius, as the poses and gestures of the limbs.[49] The meaning of *katagrapha*, or *obliquae imagines* assigned to Kimon is difficult to define. It is understood either as three-quarter[50] or profile views.[51] The context suggests the former meaning since it speaks of original features, although *in obliquam* defines a profile view in another passage in Pliny,[52] and *katagraphon* is explained as *katanomi* (profile) by the lexicographer Hesychius.[53]

We have seen that the surviving sources describe experiments with the rendering of emotion, motion and lifelike poses. Although they provide little information about the rendering of anatomical features, they usually assign to the same painters and sculptors the development of some anatomical details and that of lifelike poses and motion: Eumares was "the first to distinguish men from women and to imitate every sort of figures" (**T19**), Kimon of Kleonai suggests the joints and veins, and invented the *katagrapha* or *obliquae imagines* (**T19**), Polygnotos of Thasos portrays figures with an open mouth, bared teeth and facial

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1896), 101.

[49]Cic., Verres II, 1, 21, 57. Ps.-Ascon., *figuram: est circa gestum situmque membrorum*, see *Recueil Milliet*, 76, note 1.

[50]Pollitt, *Ancient View*, 108, note 8, and for a full comment on the meaning, commentary by Croisille, *Pline, Histoire Naturelle* 35, 173, note 4.

[51]Sellers, *Pliny's Chapters on Art*, 101.

[52]*HN* 35. 90.

[53]See Hes. *s.v.* κατάγραφον, *Recueil Milliet*, 68, note 1.

expression (**T12**), and also uses the poses of the figures to suggest emotion (**T10, T11**), Pythagoras of Rhegion adds veins and improves the rendering of the hair (**T20**), suggests emotion (**T21**), and aimed at *rhythmos* (**T16**). It seems that artists interested in the rendering of lifelike poses were also concerned with a more naturalistic rendering of human anatomy. In fact, the growing knowledge of human anatomy helped the rendering of motion, emotion and individualized features since the latter depends on the shape of anatomical features.

The small amount of evidence provided by literary testimonia about the rendering of anatomy in Archaic and early Classical Greek art may be partly explained by the nature of the extant texts. With the exception of Vitruvius' *de Architectura,* they were not devoted specifically to art, and discuss it as a disgression from other subjects.[54] Their writers were not practising artists and often considered that art achieves its end through *mimesis*, the imitation of phenomena of the visible world.[55] It is likely that the growing interest in the rendering of emotion and lifelike poses appeared to them as a major breakthrough with the Archaic conventions of representation rather than the development of a more naturalistic rendering of anatomy.

The extant texts mention a rising interest in the rendering of the *phenomenon* and the everyday appearance of the human figure from the years following the Persian Wars. The

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[54]*E.g.* the accounts of art in the Elder Pliny's, *Natural History*, are disgressions from the book on metals (33 & 34), and types of earth (35), while Quintilian and Cicero use short histories of art as analogies to stylistic developments of Greek and Roman rhetoric.

[55]For the two main ideas in the accounts of art, *mimesis* and *phantasia*, see Schweitzer, B., "Mimesis und Phantasia" *Philologus* 89 (1934) 286-300. Rouveret, *Peinture et Imaginaire,* 383-423.

growing concern with a more naturalistic rendering in art during this period is further confirmed by a fragment of a play assigned to Aeschylus. It describes a group of satyrs marvelling at the extraordinary lifelike appearance of carved representations of themselves (**T25**). In this passage, Aeschylus refers to the εἴδωλον as a μίμημα and introduces, as far as we know, a new meaning for this latter term. It defines the realism and closeness to life of a reproduction,[56] while the original meaning of *mimesis,* or rather of *mimos* and *mimeisthai,* since *mimesis* remains a rare word in the fifth century, was the imitation of animate beings, animal and human, by the body and the voice rather than by artefacts such as statues or pictures.[57]

Despite the emphasis laid on the years following the Persian Wars by the preserved texts, these experiments were probably carried out from the beginning of the fifth century since artists such as Kimon of Kleonai, Polygnotos of Thasos, Kritios and Nesiotes, and Pythagoras of Rhegion may have been active already from the first quarter of the fifth century but their earlier works lost and unknown by later writers. Literary descriptions of Archaic Greek art are rare. Several important sources such as Pliny, Quintilian, or Cicero, concentrate on painters and sculptors working after the Persian Wars to Apelles and the sons of Lysippos.[58] The treatment of Archaic art in the extant sources may be due to the use of earlier

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[56]For μίμημα, see Else, G. F., "Imitation in the fifth century" *ClPhil* 53 (1958) 78-90.

[57]For the list of the different meaning and occurences of *mimeisthai* and *mimesis* in the fifth century, see *ibid.,* 78-82.

[58]For instance, Pliny, after a brief account of Archaic sculptors, starts his history of marble sculpture with Pheidias: *HN.* 36. 9-15. Quintilian, starts with Kallon and Hegesias (*ca.* 480): *Inst.* 12. 10. 7.

records which either intentionally excluded archaic subjects,[59] or which "[by] some accident must have suppressed the whole earlier part of art history with the exception of some fragments"[60] It may also be explained by the small number of Archaic works preserved and hence to the lack of knowledge of the art of this period on the part of Roman and Greek authors. Therefore, it is not clear whether the sculptors and painters noted in literature were the earliest to experiment with a more naturalistic rendering of the human figure or whether they were mentioned because their works were known or praised by later authors and their sources.

B. On Greek anatomical knowledge until the 480s

The extant medical sources are scarce for the period preceding the Persian Wars. The earliest known treatise is attributed to Demokedes of Kroton (530-500),[61] whose work is described by Herodotus in a few anecdotes,[62] while, for the early fifth century, literary evidence only refers to the researches of Alkmaeon of Kroton (*ca.* 490-450).[63] Mentions of his

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[59] For instance, the disdain of Aristotle for the *ἀρχαίων ἔργα*, *Pr.*1. 45. 895b36, and one of the Greek sources of Pliny's book 34 which migh have begun directly with Pheidias for the life of famous sculptors, see Gallet de Santerre, Le Bonniec, *Pline l'Ancien, Histoire Naturelle, Livre 34* (Paris 1983)[2] 49-52.

[60]See, for instance, for the sources of the passages on Greek art in Pliny's Natural History, Sellers, *Pliny's Chapters on Art*, xxv.

[61]Suid., *s.v.* Demokedes

[62]Hdt. 3. 131-138.

[63]Ancient sources report that he was active when Pythagoras was old (Arist., *Metaph.*

theory of health and disease, of embryology and reproduction, and of his analysis of the sensory organs are transmitted by later authors who incorporate elements of Alkmaeon's theory in their own writings.[64]

Since there is little preserved evidence of medical writings, it is useful to consider the anatomical terms used by contemporary lay texts, and then compare them with that used by physicians to attempt to reconstruct the Greek anatomical knowledge of Archaic times. Although slightly later, the works of physicians and philosophers such as Anaxagoras (fl. 470-460),[65] and Empedokles (460-430) are included.[66] They probably based a part of their researches on the human body on the theories of their predecessors and hence might provide us with significant information about their anatomical knowledge.

Homeric poems display a rich anatomical vocabulary including descriptions of internal organs and bones.[67] In the *Iliad*, the term κοτύλη is introduced to define where the head of

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986a29f), and that he was taught by him (Iamblichus *VP* 104). This information is challenged and its dates vary from 490 to 430. On the question of Alkmaeon's date, see Lloyd, G.E.R, "Alkmaeon and the early history of dissection", *Methods and Problems in Greek Science* (Cambridge 1991), 168.

[64]About the handful of texts which form our evidence see Mansfeld, J., "Aristotle and the Preplatonic doxography and chronography", *Studies in the Historiography of Greek Philosophy* (Assen/Maastricht 1990) 22-83; for the transmission of evidence about Alkmaeon, see Mansfeld, J., "Alkmaeon: "Physikos" or physician ?" *Kephalaion* (Assen 1975) 26-38.

[65]For the evidence of Anaxagoras dates, see Schofield, M., *An Essay on Anaxagoras* (Cambridge 1980) 34-35.

[66] Wright, M. R., *Empedokles*, 3-6.

[67]Among the abundant bibliography, see Daremberg, Ch., *La médecine dans Homère* (Paris 1865), Körner, O., *Die ärtzliche Kenntnisse in Ilias und Odysse* (München 1929); and more recently, Smith, W.D., "Physiology in the Homeric poems", *TAPS* 97 (1966) 547-556; Cordes, P., "Innere Medizin bei Homer? " *RhM* 134 (1991) 113-120.

the thighbone (the femur) fits into the hipbone. In the same passage, the author identifies the hipbone (ἰσχίον), and mentions the double-tendon retaining mechanism which exists between the head of the femur and the hip.[68] In the description of the mortal wound of Sarpedon,[69] he refers to the φρένες which border the heart (καρδίη, κῆρ, ἦτορ, φρένες, πραπίδες) and prolapse when a spear is withdrawn from the thorax, and which may be identified either with the lungs[70] or with the diaphragm.[71] The authors of the *Iliad* and *Odyssey* are aware of several other internal organs : the brain (ἐγκέφαλος), the pharynx -which sometimes includes the gullet (oesophagus) and the larynx (λαιμός, λαυκανίη)-, and the vein which runs along the back to the neck (φλέψ), the lungs (πνεύμων), the liver (ἧπαρ), the bladder (κύστις), and the abdominal viscerae or entrails (ἔντερα, σπλάγχνα). He occasionally gives more details on the components of these organs: the fat around the kidneys (δημὸς), the marrow in the bones (μυελός), and the bile (χολὴ) mixed with blood (αἷμα); and even introduces anatomical terms which remain unique in Archaic literature: the blood-vessel which links the

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[68]*Il.* 5. 305: τῷ βάλεν Αἰνείας κατ' ἰσχίον, ἔνθα τε μηρὸς
ἰσχίῳ ἐνστρέφεται, κοτύλη δέ τέ μιν καλέουσι
θλάσσε δέ οἱ κοτύλην, πρὸς δ' ἄμφω ῥῆξε τένοντε

often quoted, see Daremberg, *La médecine*, 30; Collinge, N.E., "Medical terms and clinical attitudes in the tragedians", *BICS* 9 (1962) 43.

[69]*Il.* 16. 481.

[70]Lloyd, G. E. R., *Science Folklore and Ideology: Studies in the Life Science in ancient Greece* (Cambridge 1983) 152; com. Janko, R., *the Iliad: a Commentary. Books 13-16*, (Cambridge 1992) 380.

[71]Daremberg, *La médecine*, 51. The meaning of φρένες is difficult to define in Homer. It is also used to define the organs which hold the liver: *Od.* 9. 301.

lungs to the throat (ἀσφάραγος),[72] and the area around the kidneys (ἐπινεφρίδιος).[73] Tendons and sinews are sometimes noted on the joints: at the posterior aspect of the neck,[74] at the anterior aspect of the elbow,[75] between the thigh and the hips laterally (the coxo-femoral joint),[76] at the posterior aspect of the ankle (between the calf and the heel).[77] Other lay sources do not much develop the Homeric terminology on internal organs. In the extant texts, Archilochos further specifies that the liver is not enclosed by bile,[78] while Aeschylus defines the nature of the σπλάγχνα as smooth and the shape of the liver as a lobe (λόβος),[79] and notices the connection between a lung wound and the spitting of blood.[80]

The Archaic texts have the vocabulary to describe the superficial anatomy of the head, body, and limbs. Several terms are introduced to identify specific areas of the human body: the top of the head (βρέγμα, βρέχμος), the region of the mouth (παρήιον), the pit of the neck (δείρη), the umbilical region (μέση γαστήρ), the lower part of the abdomen (κενεών,

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[72]*Il.* 13. 546-547. Aristotle identifies it with the *venea cava*, *HA* 513b26. See *The Iliad: a Commentary. Books 21-24*, com. Richardson, N., vol. 6 (Cambridge 1993), 139.

[73]The word appears to be an absolute *hapax*, see *The Iliad: a Commentary*, vol. 6 (Cambridge 1993) 70.

[74]*Il.* 10. 455-456: ὅ δ' αὐχένα μέσσον ἔλασσε φασγάνῳ αἴξας, ἀπὸ δ' ἄμφω κέρσε τένοντε. *Il.* 14. 465-466: τόν ῥ' ἔβαλεν κεφαλῆς τε καὶ αὐχένος ἐν συνεοχμῷ/ νείατον ἀστράγαλον, ἀπὸ δ' ἄμφω κέρσε τένοντε.

[75]*Il.* 20. 478-479: "Τένοντες ἀγκῶνος ".

[76]*Il.* 5. 307:"Θλάσσε δέ οἱ κοτύλην, πρὸς δ' ἄμφω ῥῆξε τένοντε"

[77]*Il.* 4. 521: "ἀμφοτέρω δὲ τένοντε".

[78]Archil. F234 (*IEG*) [= Ath. 107 fr.]: χολὴν γὰρ οὐκ ἔχεις ἐφ' ἥπατι.

[79]*Pr.* 493-494.

[80]A., *A.* 1389-1390, passage connected with a description found in the *Iliad*, 16. 162. See Collinge, *BICS* 9 (1962) 43-55.

νιαίρη γαστήρ, λαπαρή), the groin (βουβὼν), the area between the shoulders (μετάφρενον), the palm of the hand (καρπός χεῖρος), the bend of the knee (ἰγνύη).[81]

The terms used may occasionally reflect the knowledge of the shape, nature, and function of the anatomical features and organs.[82] The name of some bones reveals their shape. Κληίς (clavicle) also means key, ὠμοπλάτη (shoulder-blade) is the flat part of an oar, and κοτύλη (the part of the hipbone where the thighbone is inserted) is also a small cup. In a similar manner, ἀσφάραγος which may identify the trachea in a passage of the *Iliad*,[83] usually denotes the asparagus, the thin stalk of which recalls the form of the trachea. In other cases, the term used refers to the nature and aspect of the organ. Λαπάρη (the flank) comes from the adjective λαπάρος (soft), χολή(the bile) from a root which means "yellow".[84] The term may also indicate the function: τένων (the tendons) comes from the verb τένω, to extend.

Nonetheless, a close analysis of Homeric and other Archaic vocabulary shows that it remains imprecise.[85] Parts of the body mentioned in some passages do not correspond to any real anatomical features but rather to vague areas.[86] Muscles and bones are usually identified

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[81]For other examples, see glossary nos. **14, 23, 40.**

[82]Irigoin, J., "La formation de l'anatomie en grec: du mycénien aux principaux traités de la Collection Hippocratique", *Hippocratica, Actes du Colloque Hippocratique de Paris, 4-9 septembre 1978,* ed. Grmek, M.D (Paris 1980) 250-252.

[83]*Il.* 13. 546-547.

[84]Irigoin, *Hippocratica*, 251.

[85]This was already noticed for Homeric anatomical vocabulary by Lloyd, *Science, Folklore, and Ideology*, 152.

[86]*E. g.* see glossary nos **17, 34, 39, 41.**

by their position on the body (e.g. on the upper limb, forearm, thigh, calf) combined with the general term μῦς (for muscles) ὀστεον (for bones), rather than by a specific anatomical term. Νεῦρον and τένων are applied to a wide range of tendons, ligaments and sinews.[87] Ἔγκατα and σπλάγχνα refer to the internal parts of the chest and abdomen without any further details, and are applied to both humans and animals. Φλέψ occurs only twice in the "lay" texts and it is not clear whether it defines a blood-vessel or an artery.[88]

In the extant texts, and more specifically in the Homeric poems, some descriptions are anatomically incorrect.[89] The blood-vessel (φλέψ) which, in the *Iliad*, runs straight up the back through the neck does not exist. It cannot be the jugular vein since it appears on the neck only laterally.[90] The description of the spinal column spurting marrow when the head is cut off,[91] and tendons usually regarded as being in pairs,[92] are also anatomically impossible phenomena.

Although it has been sometimes maintained that the anatomical knowledge displayed in

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[87]According to the extant texts, it is only from the time of Galen (2nd century A.D.) that physicians went into the ambiguities of the term for "nerves", "ligaments" and "tendons", providing their own careful distinction between these three structures (Gal., *AA* 14. 2). See on the hesitant differentiation of these terms in Greek anatomical vocabulary, Potter, P. "Herophilus of Chalcedon: An assessment of his place in the history of anatomy", *Bull. of the History of Medicine* 50 (1976) 50.

[88]*Il.* 13.546. A., *F.* 379 (Mette) [=Et. Gud.].

[89]For these anatomical mistakes see Friedrich, W-H., *Verwundung und Tod in der Ilias, Homerische Darstellungsweisen* (Göttingen 1956), 43-51.

[90]*Il.* 13. 546. Contra, Körner (*Die ärzlichen Kenntnisse in Ilias und Odysse*, 25-26) who identifies this vein with either the carotid or the jugular vein.

[91]*Il.* 20. 482.

[92]The singular is never found in Homer and five out of eight occurences of the term are in the dual number, see Kirk, G.S, *The Iliad: a Commentary. Books 1-4*, vol. 1 (Cambridge 1985), 395.

Homeric poems could not have been attained without dissection,[93] the lack of anatomical accuracy and the choice of internal anatomical features and organs mentioned in Archaic Greek texts suggest that writers were not aware of the practice of dissection. Their knowledge must have been common enough both from warfare and the cutting up of sacrificial animals.[94] The tendons noted in several passages are usually those of the joints (on the limbs and neck) which are visible on the surface of the body. Of the internal organs, the liver, occasionally described with anatomical accuracy, was used by the haruspices. Entrails, heart and bladder were also organs examined during the *hieroscopia*.

Through the Archaic period, the extant lay texts often depict muscles, bones and internal organs in a combination of imagination and reality. These descriptions are often used to reinforce the pseudo-realistic aspect of either the battle wounds, or of the action. In this respect, other passages also record unusual features of the human body to emphasize a specific aspect of the figure's character. In lyric poetry, Alkaeus mentions knock-kneed (σάραπος) and cracked-footed (χειροπόδες) figures[95] and Hipponax describes a character

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[93]Körner, O., *Die ärzlicher Kenntnisse*, 25-26.

[94]Authors of the beginning of the century already considered fight injuries and animals' sacrifices to be important means to increase the anatomical knowledge during the Archaic period: Hopf, L., *Die Anfänge der Anatomie bei den alten Kulturvölke*r, *Abhdlg. z. Gesch. d. Med.* 9 (Breslau 1904), Edelstein, L., "The history of anatomy", *Ancient Medicine. Selected Papers of Ludwig Edelstein,*[2] eds. Temkin, O., Temkin, C.L.(Baltimore 1987), 252. About sacrifices, see recently Gladigow, B., "Anatomia sacra. Religiös motivierte Eingriffe in menschliche oder tierische Körper", *Anc. Medicine in its Socio-cultural Context: Papers read at the Congress held at Leiden University* (Amsterdam 1995), 350-353.

[95]F429 (Campbell) [=D L 1. 81].

who urinates blood and spurts bile from the rectum.[96]

Anatomy is also used to emphasize the beauty of some figures. Authors, like Pindar, who often praise victorious athletes, and handsome gods or beautiful goddesses, do not provide us with detailed descriptions of the body. Instead, they occasionally extolled some anatomical features which beautify and grace those who possess them: luxuriant hair and elaborate hair-styles,[97] long eyelashes,[98] thin and strong limbs.[99]

Although often ambiguous, the anatomical descriptions also reflect a keen interest by a large audience in the body and its parts. "Heroic poetry could not have described the fighter's injuries in such detail if the listeners had not found pleasure in such portrayals, ... the people to whom it addresses were fascinated by what happened to the body."[100] This interest is carried on by fifth-century texts. Herodotus records, among the bones of the slain warriors of the army of Xerxes in the field of Plataea, a skull without sutures, a jaw-bone in which all the teeth were fused into a single ridge of bone, and a skeleton measuring five cubits in length.[101] He also threw stones at the skulls of the Persians and Egyptians that lay in the battlefield of Pelusium to check their relative hardness, and found those of the Persians to be more fragile

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[96]*F 73* (*IEG*) [*P. Oxy.* 2174, fr. 4.]: "ὤμειξε δ' αιμα καὶ χολὴν ἐτίλησε"

[97]Pi. *P.* 9. 186; *N.* 10. 17:καλλικόμον. *P.* 10. 61; *Pae.* 6. 137:χρυσέα κόμα; *Fr.* 1: λιπαροπλοκάμα.

[98]E.g. Alcm., F1 (Campbell, vol. 2) [=P. Louvre E 3320, 21, 69]: ἐροβλεφάρα, ἰανογ(λ)εφάρων. Pi., *P.* 4, 305: ἐλοκογλεφάρον

[99]E.g. Simon., F543 (Campbell, vol. 3I) [=DH, *Comp.* 26]: φίλαν χέρα; Pi., *O.* 12. 49: αἴγλα ποδῶν; Pi., *P.* 9. 16: ἀργυρόπεζα; Pi., *N.* 3. 96: ἀγλαόκαρπον, 7. 6: ἀγλαογυίον

[100]Edelstein, *Ancient Medicine*,[2] 262.

[101]9. 83. 2

than the Egyptians'.[102]

From the preserved fragments of medical writings, it seems that physicians were interested in sensory organs. According to Theophrastus, Alkmaeon investigates the functioning of the ear, nose, eye and tongue, and conjectures about a connection between them and the brain. Hearing takes place through the ears, because they contain a void (κενὸν) which resounds: sound is produced in the cavity and the air echoes it. Smelling is affected by means of the nostrils along with respiration, when air is drawn up into the brain. Tastes are distinguished by the tongue. Since it is warm and soft it dissolves substances with its heat and, owing to its porous and delicate structure, it receives and transmits the flavour. The contents of the eye are imagined as fire and water, and sight is formed through the gleaming (στίλβον) and transparent (διαφανής) element when it gives back a reflection; the purer this element is, the better the eye sees. Since all these senses are in some way connected with the brain, they are incapacitated when the brain is disturbed or shifts its position, for then it stops up the channels (πόροι) through which the senses act.[103]

Alkmaeon's deduction may suggest that he knew some of the channels which connect the sensory-organs (ear, nose, eye, and mouth) to the brain. Owing to the vague description he provides, it is difficult to define which channels he may have observed, and whether his

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[102]1. 259. All these descriptions and further comments are mentioned in Dawnson, W.R., "Herodotus as a medical writer", *BICS* 33 (1986) 93.

[103]Thphr. *Sens.* 25 (Diels-Kranz 24A5). I follow the translation proposed by Longrigg, J., *Greek Rational Medicine, Philosophy and Medicine from Alkmaeon to the Alexandrians* (London and New York 1993), 49-50. See also the commentary of Stratton, G. M., *Theophrastus De Sens.*, (repr. Amsterdam 1967), 89-90.

investigation implied the use of dissection. In the case of smelling and hearing, it is generally admitted that the use of a probe would be the most effective way to demonstrate the *pneuma*-carrying channels leading from the ear and nose to the brain; and that he was aware of the nostrils, Eustachian tubes and the external auditory meatus.[104] So far as the eye is concerned, it seems that a more detailed examination of its internal structure is required to identify the channels of communication with the brain which are likely to be the optic nerves.[105] A late source, Chalcidius, in a passage of the *Commentary on Plato's Timaeus*, mentions Alkmaeon as the first to dare to practise excision (*primus exsectionem aggredi est ausus*), and credits him, along with Kallisthenes and Herophilus, with the discovery of the *pneuma*-conducting optic nerves and of the four tunics of the eye.[106] It has been shown that Chalcidius' reference to Alkmaeon concerned only the use of dissection which, in the literary context, must be limited to the eye only.[107] Therefore, if our interpretation of the channels (πόροι) of the eye as the optic nerves is correct, Alkmaeon may have done no more than cut out the eyeball to learn of this most obvious and distinct structure behind the eye.[108] Empedokles also developed a theory on sight. From what we learn in Aristotle, he seems to know more than Alkmaeon about the composition of the eye since he mentions tissues (μῆνιγξ) and membranes

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[104]For an exhaustive description of the possible channels considered by Alkmaeon, see Lloyd, *Methods and Problems*, 174-175.

[105]Lloyd, *Methods and Problems*, 175.

[106]Quoted by Aëtius, 4. 13. 12 (Diels-Kranz 24B, 10).

[107]For a complete rejection of the use of dissection by Alkmaeon, see Mansfeld, *Kephalaion,* 26-38.

[108]Lloyd, *Methods and Problems*, 177.

(ὀθόνη).[109] Yet, like Alkmaeon, he is vague about the structure and the relation between the parts of the eye (retina, cornea, sclera.). He explains vision by employing the analogy of a lantern,[110] and by a pore and effluence theory which he may have developed by inference and not observation.[111]

The blood-vascular system is another much discussed topic by early writers, although the knowledge displayed in the texts may appear confusing and is a subject of debate. Aëtius, writing about Alkmaeon's theory on sleep, quotes the term "blood-running" applied to the veins (αἱμόρρους φλέβες). It has been claimed that the use of this adjective may foreshadow the distinction between veins and arteries,[112] or the contrast between the major blood-vessels in the interior of the body and the smaller, mostly superficial, blood-vessels.[113] The first interpretation seems most unlikely given the other extant texts.[114] The term is used in some early texts of the Hippokratic Corpus (*ca.* end of the fifth century) for both arteries and

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[109]Arist., *Sens.* 437b23. See Wright, M.R., *Empedokles, the extant Fragments*[2] (London 1995), F88, 126-127.

[110]F88 (Wright), [=Arist., *Sens.*, 437b23].

[111]Thphr., *Sens.* 7. Pl, *Men.* 76c. For further details about Empedokles' theory on vision, see Logrigg, *Greek Rational Medicine,* 71-72. For the lack of direct observation in Empedokles' theories, Lloyd, *Science Folklore and Ideology*, 181.

[112]See discussion in Harris, C.R.S., *The Heart and the Vascular System in ancient Greek Medicine. From Alkmaeon to Galen* (Oxford 1973) 8-9.

[113]Lloyd, *Methods and Problems*, 177.

[114]For Aristotle and Plato, there was no clear distinction between arteries and veins, although the former made broad distinctions between vessels communicating with the right, and those with the left side of the heart. Aristotle used the term φλέψ indifferently to mean both arteries and veins, and the term artery only to designate the windpipe. See Harris, *The Heart and the Vascular System*, 121, note 4; and Lloyd, *Science, Folklore and Ideology*, 152-153.

veins,[115] while the clear distinction between these two features is only developed by later authors such as Herophilus,[116] and in the late texts of the Hippokratic Corpus,[117] who first used the term ἀρτηρίη to identify the arteries as opposed to φλέψ for the veins.[118] Αἱμόρρους is also applied to veins by two tragedians, Aeschylus and Sophokles, contemporary with Alkmaeon, who probably ignore the distinction between veins and arteries.[119] Although Alkmaeon may have made a distinction between major-internal, and secondary-superficial blood-vessels, it seems more probable that he introduced the qualifying adjective "blood-running" to distinguish certain vessels from others thought to carry diferent substances, including air, various humours, milk and semen, round the body, since this latter belief was widespread among Greek physicians and philosophers.

Further evidence of the anatomical knowledge of the vascular system may be found in Empedokles' fragments. From a quotation in Stobaeus,[120] it seems that he was aware of the concentration of blood around the heart although it is not clear whether he knew of the coronary arterial system which surrounds it. Empedokles, along with his contemporary

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[115]Hp., *Morb.* I. 3.; *Morb.* II. 5.; *Aff.* 29. Duminil, M-P., *Le sang, les vaisseaux, le coeur dans la Collection Hippocratique* (Paris 1983), 26-28.

[116]Hierophilus defines the difference between veins and arteries according to the thickness of their coats: F116 (von Staden) [=Gal., *UP* 6. 10]. He also mentions the "ἀρτηριώδης φλέψ", F 117 (von Staden) [=Ruf., *Onom.* 203-204].

[117]Hp., *Alim.* 31

[118]For the development, use and meaning of ἀρτηρίη, see Irigoin, *Hippocratica*, 254-256, who concludes that "du point de vue de la linguistique apparaissent vaines les tentatives présentées ces dernières années pour faire remonter jusqu'au milieu du Ve siècle la distinction des veines et des artères".

[119]A., *Fr.* 379 (Mette) [=*Et. Gud.*]. and S., *Ph.* 825

Hippon,[121] introduces the term περικάρδιον to define this area, although it does not yet identify the membrane around the heart as it does in later medical writings.[122] Plutarch tells us that Empedokles applied the adjective πολυαίματον (rich in blood) to the liver.[123] It probably refers to the haemorrhagis character of this organ due to its great vascularity, rather than indicating a knowledge of its haemotopoeic function.[124] Empedokles, from what we learn in Aristotle, also mentions channels of flesh which stretched over the surface of the body and contain blood and air.[125] In his theory of respiration, he connects this function with the movement of blood combined with that of air, and develops a notion close to that of poral respiration. Again, it seems clear that his ideas are based on conjecture and inference and that he did not use dissection to observe the subcutaneous blood-vascular system.

The extant medical texts dating back to the first half of the fifth century deal with the functioning of the senses, and the blood-vascular system. They do not focus on surface anatomy and the skeleton,[126] and remain vague about the physiology of internal organs. On the other hand, Archaic lay texts provide more information in their descriptions of battle wounds

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[120]1.49.59, F94 (Wright).

[121]Philop. 2. d. St. 92, Diels-Kranz 38A 10

[122]See Bollack J., *Empedokles*, vol. 3, 447; and Wright, *Empedokles* 251, 3.

[123]F147 (Wright) [=Plu., *Moralia,(Symposiaca)* 683c]

[124]For Empedokles' knowledge of the haematopoic function of the liver, see Bollack, *Empedokles*, 442-444. Longrigg,*Greek rational Medicine*, 75.

[125]F91 (Wright) [=Arist., *Resp.* 473a 15].

[126]The latter is developed in Hp. *Fract.* For the vocabulary related to the skeleton and developed in this treatise, Irmer, D., "Die Bezeichnung der Knochen in *Fract.* und *Art.*", *Hippocratica* (1980), 265-283.

about superficial anatomy, internal organs, and bones. The lack of anatomical knowledge which occurs in medical texts may be partly explained by their fragmentary state of preservation. However, it may be also due to a specific interest on the part of early Greek physicians in the senses and blood-vascular system. They seem more concerned with the identification of the constituents of the sensory-organs (mainly the eye), flesh and blood with the four primary elements (air, water, fire, and earth).[127] Early Greek physicians were also philosophers,[128] and they probably focused on the sensory-organs and blood-vascular system because they could explain their functioning in terms of primary elements which they also used to explain the functioning of nature (φύσις).[129] In a similar manner, early theories on health rely on the balance of physical elements in the blood,[130] and the accurate knowledge of

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[127]*E.g.* Alkmaeon, elements of the eye (water and fire): Diels-Kranz 24A, 5 [=Thphr. *Sens. 25*]. Empedokles, on the physical elements of the flesh, sinews and bones (air, water, fire, earth): F460 (Bollack) [=Aët. 5.22.1]; on the physical elements of the eye (fire, earth and air): F420. 8 (Bollack) [=Thphr., *Sens*. 1. 8]. Hippon, the physical element of the brain (the water); Diels-Kranz 38A 3 [Hippol., *Haer*. 1. 16].

[128]Diogenes Laertius (8. 83) says that Alkmaeon wrote "chiefly on medical subjects (ἰατρικὰ), but now and again touches upon natural philosophy (φυσιολογεῖ)" (Diels-Kranz 24A 1). On the authority of Aristotle, Diogenes states that Empedokles wrote tragedies, political works (Diels-Kranz 31A 1 [=DL 8.57]) and credits him with medical writings (῾Ιατρικὸς Λόγος) and a work on nature "Περὶ Φύσεως "(Diels-Kranz 31A, 1 [=DL 8. 77]).

[129]The attempt of early physicians to base medicine and physics on the same philosophical principles is confirmed in the critique on previous philosophers and doctors by the author of *Ancient Medicine*,in the Hippocratic Corpus. See *Hippocrate. De l'ancienne médecine*, ed. & com. Jouanna, J. (Paris 1990) 22-34. Lloyd, "Who is attacked in 'on ancient medicine'?", *Methods and Problems*, 49-69.

[130]A theory already assigned to Alkmaeon by Aëtius: " ᾽Αλκμαίων τῆς μὲν ὑγιείας εἶναι συνεκτικὴν τὴν ἰσονομίαν τῶν δυνάμεων, ὑγροῦ, ψυχροῦ, θερμοῦ, πικροῦ, καὶ τῶν λοιπῶν, τὴν δ΄ ἐν αὐτοῖς μοναρχίαν νόσου ποιητικήν" (Diels-Kranz 24B 4 [Aët. 5. 30. 1]).

superficial anatomy and physiology of internal organs may have appeared as a secondary issue to early medical writers since they did not consider them in their account of pathology.[131]

The analysis of the anatomical knowledge displayed in medical texts may show to what extent early Greek physicians relied on animal dissection. Some rare references to this method practised by fifth century physicians are known: Chalcidius, in his *Commentary on Plato's Timaeus*, refers to Alkmaeon as the first to practise excision; Aristotle, in *Historia Animorum,* mentions the dissection of dead animals as one of the methods used by his predecessors to investigate the blood-vascular system,[132] and Plutarch reports that Anaxagoras cut open the head of an animal to see what disease it had suffered from.[133]

It has already been demonstrated that the statement found in Chalcidius refers to the use of dissection by Alkmaeon in studying the eye.[134] Alkmaeon's lack of knowledge of the internal structure and physiology of this organ suggests that he probably did no more than cutting out the eyeball.[135] It has been also shown that Empedokles' account of sensation in terms of pores and effluences, "need not be the result of deduction from clinical experience, but could equally be reached by reasoning from a physical theory that aimed to be all-

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[131]See Edelstein, *Ancient Medicine*[2], 248. Duminil, *Le sang, les vaisseaux*, 7-8.

[132]*HA* 3. 2. 511b13.

[133]A16 (Lonza) [=Plut., *Pericl.* 6]

[134]See Lloyd, *Methods and Problems*, 170.

[135]Lloyd, *Methods and Problems*, 176-177.

embracing".[136]

Evidence of direct observation of dead animals may be seen in Alkmaeon's theory on sleep, and in Empedokles' fragments. Alkmaeon explains sleep and death by the retreat of blood in the "blood-carrying" vessels. It has been claimed that he probably based his theory on the investigation of the blood-vessels of dead animals which were usually drained of blood.[137] Empedokles' descriptions of the heart surrounded by blood, and of the liver filled with blood,[138] suggest a direct observation of internal organs. Yet, both physicians may have examined animals killed for sacrifices or for eating, as probably did their lay predecessors, rather than practising dissection since the descriptions they provide us with are vague.

Even if we accept that, from the early fifth century, dissection may have been occasionally practised on animals, there is no evidence of its use by Greek physicians on humans. Herodotus tells us that King Cambyses of Persia dissected a boy to trace back the path of the arrow which killed him,[139] but he probably reports the anecdote because the practice seemed exceptional to a Greek as did the embalming methods of the Egyptians which he also describes.[140] Indeed, it is clear that the possibility of human dissection did not even

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[136]Wright, *Empedokles*, 9.

[137]Contra Lloyd, *Methods and Problems*, 177.

[138]Although Simplicius assigns to Empedokles a theory of digestion which describes the transformation of nourishment into blood by the liver (Diels-Kranz K 31B 61 [=Simp., in *Ph.* 371. 33]), I have not considered it since the attribution of this passage to Empedokles has been challenged in the recent editions of his fragments which did not include it (see Wright, *Empedokles*, who mentioned it only in the commentaries 52, note 162).

[139]3. 35. 1-5

[140]2. 86.

occur to Aristotle. In a well-known passage, he says that "the inner parts of a man are, for the most part, unknown, and we must refer to those of other animals which resemble men and examine them",[141] and in another passage, he mentions earlier investigators who relied on observation of emaciated humans to examine the vascular-system.[142] Two reasons may explain why Greek physicians did not have recoursed to human dissection.[143] Religious and magical taboo probably played an important part. Veneration of the dead, and dread of the corpse probably made dissection impossible. Additionally, we have seen that physicians explained diseases by a lack of balance between the different elements in the human body (air, water, blood). For this reason, the treatment of disease in Greek medicine did not depend on the knowledge of internal organs, and occasional autopsies, even if they took place, were of no importance for medicine.

It has been noted that, from the time of composition of the *Iliad* and *Odyssey*, Archaic Greek literature was interested in the human body. It mentions superficial anatomical features, bones, tendons and some internal organs, the knowledge of which was probaby acquired by a close observation of the body, battle wounds and animal sacrifices. This concern with anatomy, carried on by fifth-century writers such as Aeschylus and Herodotos, implies that they address an audience interested in the human body and its components since early Archaic times. From the early fifth century, the extant medical texts show a growing concern with

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[141] *HA* 494b 21

[142] *HA* 3. 2. 511b13.

some aspects of the human body (the sensory organs, and blood vascular system) although physicians still use old philosophical principles to explain them, and do not provide clinical descriptions of anatomy. In fact, early Greek physicians, who were also philosophers, such as Alkmaeon and Anaxagoras, were also interested in what made humanity different from the beasts. They laid emphasis on the possession of intelligence, and used some anatomical features and internal organs to further confirm the differences between humans and animals.[144] Alkmaeon set the intelligence in the brain and attempted to relate human sensory organs to it. In a similar manner, Anaxagoras thought that it was the possession of hands which made men the most intelligent of all beings.

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[143] Both reasons were already noticed by Edelstein, *Ancient Medicine*,[2] 248.

[144]Alkmaeon quoted by Theophrastus: *Sens.* 25-26 (Diels-Kranz 24 B1a), and Anaxagoras by Aristotle, *PA* 687 a 7 (F 102 Lonza).

TESTIMONIA

1. Plin. *HN* 34. 83 (Sellers): Theodoros. qui labyrinthum fecit Sami, ipse se ex aere fudit, praeter similitudinis mirabilem famam magna suptilitate celebratus.

2. Plin. *HN* 34. 16 (Sellers): Effigies hominum non solebant exprimi nisi aliqua illustri causa perpetuitatem merentium primo sacrorum certaminum victoria maximeque Olympiae. ubi omnium qui vicissent statuas dicari mos erat, eorum vero qui ter superavissent ex membris ipsorum similitudine expressa, quas iconicas vocant.

3. Plin. *HN* 36. 11-12 (Sellers): Cum hi essent, iam fuerat in Chio insula Melas sculptor, dein filius eius Micciades. ac deinde nepos Archermus, cuius filii Bupalus et Athenis vel clarissimi in ea scientia fuere Hipponactis poetae aetate, quem certum est LX olympiade fuisse...Hipponacti notabilis foeditas voltus erat, quam ob rem imaginem eius lascivia iocorum hi proposuere ridentium circulis, quod Hipponax indignatus destrinxit amaritudinem carminum in tantum, ut credatur aliquis ad laqueum eos compulisse.

4. Paus. 1. 8. 5 (Pouilloux): οὐ πόρρω δὲ ἑστᾶσιν Ἀρμόδιος καὶ Ἀριστογείτων οἱ κτείναντες Ἵππαρχον... τῶν δὲ ἀνδριάντων οἱ μὲν εἰσὶ Κριτίου τέχνη, τοὺς δὲ ἀρχαίους ἐποίησεν Ἀντήνωρ. Ξέρξου δέ, ὡς εἷλεν Ἀθήνας ἐκλιπόντων τὸ ἄστυ Ἀθηναίων, ἐπαγαγομένα καὶ τούτους ἅτε λάφυρα, κατέπεμψεν ὕστερον Ἀθηναίους Ἀντίοχος.

5. Hdt 4. 88 (Legrand, vol. 1): Ἀπ'ὧν δὴ Μανδροκλέης ἀπαρχήν, ζῷα γραψάμενος πᾶσαν τὴν ζεῦξιν τοῦ Βοσπόρου καὶ βασιλέα τε Δαρεῖον ἐν προεδρίῃ κατήμενον καὶ τὸν στρατὸν αὐτοῦ διαβαίνοντα, ταῦτα γραψάμενος ἀνέθηκε ἐς τὸ Ἥραιον, ἐπιγράψας τάδε

Βόσπορον ἰχθυόεντα γεφυρώσας ἀνέθηκε
Μανδροκλέης Ἥρῃ μνημόσυνον σχεδίης
αὐτῷ μὲν στέφανον περιθείς, Σαμίοισοι δὲ κῦδος
Δαρείου βασιλέος ἐκτελέσας κατὰ νοῦν

6. Paus. 5. 16. 3 (Maddoli, Saladino): ...ταῖς δὲ νικώσαις ἐλαίας τε διδόασι στεφάνους καὶ βοὸς μοῖραν τεθυμένης τῇ Ἥρᾳ καὶ δὴ ἀναθεῖναί σφισιν ἔστι γραψαμέναις εἰκόνας

7. Plin., *HN*. 35. 151 (Sellers): ...Eiusdem opere terrae fiɪger ex argilla similitudines Butades Sicyonius figulus primus invenit Corinthi filiae operae, quae capta amore iuvenis abeunte illo peregre curbam ex facie eius ad lucernam in pariete liniis circumscripsit, quibus pater eius impressa argilla typum fecit et cum ceteris fictibus induratum igni proposuit...

8. Arist., *Poe*. 2. 1448a (Halliwell, vol. 23): ...ὥσπερ οἱ γραφεῖς Πολύγνωτος μὲν γὰρ κρείττους, Παύσων δὲ χείρους, Διονύσιος δὲ ὁμοίους εἴκαζεν.

9. Pl., *Cim*. 4 (Flacelière, Chambry, vol. 7): Καὶ γὰρ οὐδ' ἄλλως τὴν Ἐλπινίκην εὔτακτόν τινα γεγονέναι λέγουσι, ἀλλὰ καὶ πρὸς Πολύγνωτον ἐξαμαρτεῖν τὸν

ζωγράφον. καὶ διὰ τοῦτὸ φασιν ἐν τῇ Πεισιανακτείῳ τότε καλουμένῃ, Ποικίλῃ δὲ νῦν στοᾷ, γράφοντας τὰς Τρῳάδας τὸ τῆς Λαοδίκης ποιῆσαι πρόσωπον ἐν εἰκόνι τῆς Ἐλπινίκης.

10. Paus. 10. 25. 5 (Jones, vol. 4): Κάθηται δὲ ὑπὲρ τὴν Ἑλένην πορφυροῦν ἀνὴρ ἀμπεχομεχὸμενος ἱμάτιον καὶ ἐς τὰ μάλιστα κατηφής. Ἕλενον εἶναι τεκμήραιο ἄν τὸν Πριάμου καὶ πρὶν ἢ τὸ ἐπίγραμμα ἐπιλέξασθαι.

11. Paus. 10. 26. 9 (Jones, vol. 4): ...παρὰ δὲ τὴν Μέδουσα ἐν χρῷ κεκαρμένη πρεσβῦτις ἢ ἄνθρωπός ἐστιν εὐνοῦχος, παιδίον δὲ ἐν τοῖς γόνασιν ἔχειν γυμνόν· τὸ δὲ τὴν χεῖρα ὑπὸ δείματος ἐπίπροσθε τῶν ὀφθαλμῶν πεποίηται.

12. Plin., *NH.* 35. 38 (Sellers): Alii quoque post hos clari fuere ante LIV olympiadem, sicut Polygnotos Thasius qui primus mulieres tralucida veste pinxit, capita earum mitris versicoloribus operuit plurimumque picturae primus contulit, siquidem instituit os adaperire, dentes ostendere, voltum ab antiquo rigore variare.

13. *Anthologia Graeca* XVI. 150 (Patton, vol. 5):
Ἅδε Πολυγνώτοιο Πολυξένα, οὐδέ τις ἄλλα
χεὶρ ἔθιγεν τούτου δαιμονίου πίνακος
Ἥρας ἔργον ἀδελφὸν· ἴδ'ὡς πέπλοιο ῥαγέντος
τὰν αἰδῶ γυμνὰν σώφρονι κρύπτε χεῖρι·
λίσσεται ἁ τλάμων ψυχᾶς ὕπερ· ἐν Βλεφάροις δὲ
παρθενικᾶς ὁ Φρυγῶν κεῖται ὅλος πόλεμος

14. Arist., *Poe.* 6. 1450a. 25 (Halliwell, vol. 23): Αἱ γὰρ τῶν νέων πλείχτων ἀήθεις αἱ τραγῳδίαι εἰσί·καὶ ὅλως ποιηταὶ πολλοὶ τοιοῦτοι·οἷον καὶ τῶν γραφέων Ζεῦξις πρὸς Πολύγνωτον πέπονθεν· ὁ μὲν γὰρ Πολύγνωτος ἀγαθὸς ἠθογράφος, ἡ δὲ Ζεύξιδος γραφὴ οὐδὲν ἔχει ἦθος

15. DS 1. 98. 5-9 (Bertrac, Vernière): Τηλεκλέα καὶ Θεόδωρον τοὺς Ῥοίκου μὲν υἱούς, κατασκευάσαντας δὲ τοῖς Σαμίοις τὸ τοῦ Ἀπόλλωνος τοῦ Πυθίου ξόανον. τοῦ γὰρ ἀγάλματος ἐν Σάμῳ μὲν ὑπὸ Τηλεκλέους ἱστορεῖται τὸ ἥμισυ δημιουργηθῆναι, κατὰ δὲ τὴν Ἔφεσον ὑπὸ τοῦ ἀδελφοῦ Θεοδώρου τὸ ἕτερον μέρος συντελεσθῆναι, συντεθέντα δὲ πρὸς ἄλληλα τὰ μέρη συμφωνεῖν οὕτως ὥστε δοκεῖν ὑφ' ἑνὸς τὸν πᾶν σῶμα κατεσκευάσθαι. Τοῦτο δὲ τὸ γένος τῆς ἐργασίας παρὰ μὲν τοῖς Ἕλλησι μηδαμῶς ἐπιτηδεύεσθαι, παρὰ δὲ τοῖς Αἰγυπτίοις μάλιστα συντελεῖσθαι. Παρ' ἐκείνους γὰρ οὐκ ἀπὸ τῆς κατὰ τὴν ὅρασιν φαντασίας τὴν συμμετρίαν τῶν ἀγαλμάτων κρίνεσθαι, καθάπερ παρὰ τοῖς Ἕλλησιν, ἀλλ' ἐπειδὰν τοὺς λίθους κατακλίνωσι καὶ μερίσαντες κατεργάσωνται τὸ τηνικαῦτο τὸ ἀνάλογον ἀπὸ τῶν ἐλαχίστων ἐπὶ τὰ μέγιστα λαμβάνεσθαι. ... Τὸ δ' ἐν τῇ Σάμῳ ξόανον συμφώνως τῇ τῶν Αἰγυπτίων φιλοτεχνίᾳ κατὰ τὴν κορυφὴν διχοτομούμενον διορίζει τοῦ ζῴου τὸ μέσον μέχρι τῶν αἰδοίων, ἰσάζον ὁμοίως ἑαυτῷ πάντοθεν εἶναι δ'αὐτὸ λέγουσι κατὰ τὸ πλεῖστον παρεμφερὲς τοῖς Αἰγυπτίοις, ὡς ἂν τὰς μὲν χεῖρας ἔχον παρατεταμένας, τὰ δὲ σκέλη διαβεβηκότα.

16. DL 8. 47 (Hicks): οἱ δὲ ἄλλον ἀνδριάτοποιὸν Ῥηγῖνον γεγονέναι φασὶ

Πυθαγόραν, πρῶτον δοκοῦντα ῥυθμοῦ καὶ συμμετρίας ἐστοχάσθαι, καὶ ἄλλον, ἀνδριαντοποιὸν Σάμιον.

17. Cic. *Brut.* 70 (Martha): Quis enim eorum qui haec minora animadvertunt non intellegit, Canachi signa rigidiora esse, quam ut imitentur veritatem? Calamidis dura illa quidem, sed tamen molliora quam Canachi cet.

18. Lucianus, *Rh. Pr.* 9 (Hawton, vol. 4): εἶτα σε κελεύσει ζηλοῦν ἐκείνους τοὺς ἀρχαίους ἄνδρας, ἔωλα παραδείγματα παρατιθεὶς τῶν λόγων οὐ ῥᾴδια μιμεῖσθαι, οἷα τὰ τῆς παλαιᾶς ἐργασίας ἐστίν, Ἡγησίου καὶ τῶν ἀμφὶ Κρίτιον καὶ Νησιώτην, ἀπεσφιγμένα καὶ νευρώδη καὶ σκληρὰ καὶ ἀκριβῶς ἀποτεταγμένα ταῖς γραμμαῖς.

19. Plin, *HN.* 35. 56 (Sellers): ... et qui primus in pictura manem a femina discreverit Eumarum Atheniensem figuras omnis imitari ausum, quique inventa eius excoluerit Cimonem Cleonaeum. Hic catagrapha invenit, hoc est obliquas imagines, et varie formare voltus, respicientes suspicientesve vel despicientes. Articulis membra distinxit, venas protulit, praeterque in vestibus rugas et sinus invenit.

20. Plin. *HN.* 34. 59 (Sellers): Vicit (Myronem) Pythagoras Rheginus ex Italia pancriaste Delphis posito; ... Syracusis autem claudicantem cuis ulceris dolorem sentire etiam spectantes videntur,... Hic primus nervos et venas expressit capillumque diligentius.

21. DS 1. 97. 6 (Oldfather, vol. 1): τόν τε ῥυθμὸν τῶν ἀρχαίων κατ' Αἴγυπτου ἀδριάντων τὸν αὐτὸν εἶναι τοῖς ὑπὸ Δαιδάλου κατασκευασθεῖσι παρὰ τοῖς Ἕλλησι.

22. Paus. 8. 40. 1 (Jones, vol. 6): Φιγαλεῦσι δὲ ἀνδριὰς ἐστιν ἐπὶ τῆς ἀγορᾶς Ἀρραχίωνος τοῦ παγκραστοῦ, τά τε ἄλλα ἀρχαῖος καὶ οὐχ ἥκιστα ἐπὶ τῷ σχήμασι· οὐ διεστᾶσι μὲν πιλὺ οἱ πόδες, καθεῖνται δὲ παρὰ πλευρᾷ αἱ χεῖρες ἄχρι τῶν γλουτῶν· πεποίηται μὲν δὴ ἡ εἰκὼν λίθου, λέγουσι δὲ καὶ ἐπίγραμμα ἐπ' αὐτῇ γραφῆναι·

23. Paus. 6. 10. 1 (Jones, vol. 3): ...τοῦ Γλαύκου δὲ τὴν εἰκόνα ἀνέθηκε μὲν ὁ παῖς αὐτοῦ, Γλαυκίας δὲ Αἰγινήτης ἐποίησε· σκιαμαχοῦντος δὲ ὁ ἄδριὰς παρέχεται σχῆμα, ὅτι ὁ Γλαῦκος ἦν ἐπιτηδειότατος τῶν κατ'αὐτὸν χειρονομῆσαι πεφυκῶς.

24. *Anthologia Graeca* 16. 54 (Patton, vol. 4): οἷος ἓης φεύγων τὸν ὑπήνεμον, ἔμπνοε Λάδα, θυμόν, ἐπ' ἀκροτάτῳ νευρὰ ταθεὶς ὄνυχι,
τοῖον ἐχἀλκευσέν σε Μύρων, ἐπὶ παντὶ χαράξας σώματι Πισαίου
προσδοκίην στεφάνου

25. A. (=*POxy* fr. 1 (a) col. i. 5 [ed. in Egyptian Exploration Society 26; The Oxyrhyncus Papyri 18 (1941) 11-22]): ...εἴδωλον εἶναι τοῦτ' ἐμῇ μορφῇ πλέον
τὸ Δαιδάλου μ{ε} [ί]μημα φωνῆς δεῖ μόνον.
ταδ[...]ει.
ὁρα[.]ωρ.[.]

χωρεῖ μὰλ᾽
εὐκταῖα κόσμον ταῦτ[α] τῷ θεῷ φὲρω
καλλίγραπτον εὐχάν
τῇ μητρὶ τῇ μῇ πραγματ᾽ἄν σαφῶς
ἰδοῦσα γὰρ νιν ἄν σαφῶς
τρέπατ᾽ ἄν τ᾽ἀξιάγοιτό θ᾽ὡς
δοκοῦσ᾽ἔμ᾽εἶναι τὸν ἐξ–
ἔθρεψεν οὕτως ἐμφέρης οὐδ᾽ἐστίν...

GLOSSARY OF ANATOMICAL TERMS USED IN GREEK ARCHAIC TEXTS

Note: The passages quoted for frequently cited terms are preceeded by "*e.g.*" When the term cannot be securely attributed to the author mentioned, since quoted by another in a paraphrase, an * is added to his name. The abbreviations used are those of the Lidell-Scott-Jones (1996).

I. HEAD AND NECK

1. Κόμη/κόμα: the hair (*e.g. Il.* 1. 197, 6. 231, 20. 39, 22. 406; Thgn. 1. 829; Pi., *P.* 5. 41)

Πλοκαμίς/Πλόκαμος: the lock or braid of hair (*e.g. Il.* 11. 624, 14. 176; *Od.* 5. 125, 7.41; Pi. *P.* 4. 82; A. *Ch.* 6. 187, *Th.* 564)

Χαίτη: the loose hair (*e.g. Il.* 14. 175, *Od.* 10. 567; Tyrt., F20. 14 (*IEG*, vol. 2) [=P. Berol 11675 fr. A, col. ii]; Pi. *N.* 1. 19)

2. Κάρη: head (*e.g. Il.* 2. 259, 5. 214, 6. 209; Thgn. 1. 1024; Anacr., F395 (Campbell, vol. 2) [=Stob. 4. 51. 12]).

Κεφαλή: (E. g. *Il.* 3. 168, 16. 412; Tyrt. 11. 26 (*IEG*, vol. 1) [=Stob. 4. 9. 16]; Alc. F162 (Campbell, vol. 2) [=P. Oxy. 2394, fr. 2. 11]; Alc., F74 (Campbell, vol. 1) [P. Oxy. 1360, fr. 2 + 2166 9c0 31])

Κρανίον: only for the head of a horse (*Il.* 8. 84)

3. Βρέγμα/ βρέχμος: the top of the head (*Il.* 5. 586)

4. Πρόσωπον: the face (*e.g. Il.* 18. 414, *Od.* 18. 173; Sapph., F1 (Campbell, vol. 1) [=D.H., *Comp.*, 14])

5. Μετώπιον, μέτωπο: forehead (*e.g. Il.* 13. 615-616, 15. 102, *Od.* 22. 36; Stesich., *Geryon*, F15. 7 (Campbell, vol. 3) [P. Oxy. 2617, frs 4 & 5, col. iii])

6. Ἐπισκύνιον: "wrinkles on the forehead" *(Il.* 17. 136)

7. Ὀφρύς: brows (*e.g. Il.* 14. 236, *Od.* 4. 153, 8. 86, 531; Alc., F298. 24 (Campbell, vol. 1) [=P. Oxy. 2303, fr. 1 9a + P. Colon. 2021 (uu1-49)])

8. Ῥίν: the nose (e.g. Il. 14. 467, 23. 395; Hippon. F22, F104. 21, F118 (*IEG*, vol. 1) [=P. Oxy. 2176], nostrils (*Od.* 24. 318-319; Alcmaeon* Diels-Kranz 24A 5 [=Thphr., *Sens. 25*])

9. Βλέφαρα/ γλεφάρω: eyelids (*e.g. Il.* 10. 187, *Od.* 20. 86; Thgn. 1. 208 (*IEG*, vol. 1); Ibic., F287 (Campbell, vol. 1) [=Pl., *Prm* 137a], Alcm., F1. 21, 65 (Campbell, vol. 2) [=P. Louvre E3320]; Pi., *P.* 4. 216, 305)

10. Ὄσσε: the eyes, usually in plural (*e.g. Il.* 24. 204, *Od.* 19. 211; Sapph., F 151 (Campbell, vol. 1) [=*EM* 117. 14 ss]), the eyeball (*Il.* 14. 494, 16. 349, *Od.* 9. 390), the

shinning part of the eye (*Il.* 13. 436)

Ὀφθαλμός: the eye (*e.g. Il.* 3. 373; Pi. O. 2. 12, 6. 16, P. 214, Alkmaeon* (Diels-Kranz 24a 5) [=Thphr., *Sens.* 26]

Ὄψις: the eye (*Il.* 24. 632)

11. Γλήνη: the eyeball (*Il.* 14. 494, *Od.* 9. 390)

12. Ὀθώνη: the membrane of the eye (Emp., F88 (Wright) [=Arist. *Sens.* 473b23]

13. Μήνιγξ: the tissue around the eye (Emp., F88 (Wright) [=Arist. *Sens.* 473b23]

14. Κρόταφος: the temporal region (*e.g. Il.* 188. 805, 15. 648; Anacr., F395. 2 (Campbell, vol. 2) [= Stob. 4. 51. 12]; Pi., *F. Dithyrambes* 3)

Κόρση: (*e.g. Il.* 501-503; Alc., F388 (Campbell, vol. 1) [=Ath., Scholars at dinner, 10. 430a-b])

15. Οὖς: the ear (*e.g. Il.* 21. 455, *Od.* 12. 47-48)

16. Γναθμός: the cheek (*e.g. Od.* 16. 175), the cheeks and lips (*Od.* 20. 347), the inferior jaw (*e.g. Il.* 13. 671; Hippon., F73. 5 (*IEG*, vol. 1) [=P. Oxy. 2174, fr. 4])

Παρειαία: the cheeks, usually in plural (*e.g. Il.* 3. 35; Simon., F543. 5 (Campbell, vol. 3) [DH, *Comp.* 26]

17. Παρήιον: the area around the mouth (*e.g. Od.* 19. 208, 22. 404-405)

18. Στόμα: the mouth (*e.g. Il.* 20. 375, 16. 345, 410; Archil., F44 (*IEG*, vol. 1) [=Schol. Ar., *Lys.* 1254 sq]

19. Χεῖλος: the lips (*e.g. Il.* 22. 495, *Od.* 18. 21; Hippon., F118 (*IEG*, vol. 1) [P. Oxy. 2176])

20. Ὑπερῴη: the palate (*Il.* 22. 495)

21. Ὀδούς: the tooth (*e.g. Il.* 5. 74; Hippon., F115. 3 (*IEG*, vol. 1) [=P. Oxy. 2174, fr. 4]; Sol., F27. 1 (*IEG*, vol. 2) [=Philo., 104]; Semon., F7. 8 (*IEG*, vol. 2) [=Stob. 4. 22]; Anacr., F395 (Campbell, vol. 2) [=Stob. 4. 51. 12])

22. Γλῶσσα: the tongue (*e.g. Il.* 5. 74, *Od.* 3. 332, 341; Thgn 1. 85; Sapph., F37. 9 (Campbell, vol, 1) [=Long., 10. 1-3]; Pi., *P.* 11. 43)

23. Ἀνθερεών: the chin (*Il.* 1. 501), area below the chin (*Il.* 5. 293, 13. 387-388)

24. Αὐχήν: the neck (*e.g.* Archil. F140. 1 (*IEG*, vol. 1) [=P. Oxy. 2313, fr. 6]; Hippon., F118 (*IEG*, vol. 1) [=P. Oxy. 2175, fr. 1]; Stesich., *Geryon.*, F15. 14 [=P. Oxy. 2617, fr. 4 & 5, col. ii]; Anacr., F388. 7 (Campbell, vol. 2) [= Ath. 12. 533 fr.]

25. Λαιμός: the anterior aspect of the neck, the area below the chin (*Il.* 13. 542), the

throat (*Il.* 19. 209; Hippon., F118 (*IEG*, vol. 1) [= P. Oxy. 2176]

26.Τράχηλος: the nape of the neck (Hippon., F118 (*IEG*, vol. 1) [=P. Oxy. 2176])
'Ινίον: the nape of the neck (*Il.* 5. 73, 14. 495)
Σκύτα: the nape of the neck (Archil. F237 (*IEG*, vol. 1) [Erot.. 625]

27. Δείρη: the neck, the throat (*e.g. Il.* 2. 26, Od. 23. 208; Thgn. 1. 266; Alc., f362 (Campbell, vol. 1) [=Ath. 15. 674c-d]
Λαυκανίη: the throat (*e.g. Il.* 14. 641-642), the pit of the neck *(Il.* 22. 324-325)
Στόμαχος: the throat, the gullet (for animals, *Il.* 3. 292, 19. 266)

II. TORSO

Anterior aspect

28. Στῆθος: the chest (*e.g. Il.* 38. 31, 51, 416, 544, *Od.* 20. 17; Archil., F48. 5 (*IEG*, vol. 1) [=P. Oxy. 2310, fr. 1, col. 1uu]; Tyrt., F19 (*IEG*, vol. 2) [=P. Berol. 11675, fr. A. col. ii]
Στέρνον: the chest, the pectorals (*e.g. Il.* 4. 528, *Od.* 5. 346; Archil., F128 (*IEG*, vol. 1) [=Stob. 3. 20. 28]; Tyrt., F11. 33 (*IEG*, vol. 2) [=Stob. 4. 9. 16]; Stesich., F15. 12 (Campbell, vol. 3) [=P. Oxy. 2617, fr. 4 & 5]; A., *Pers.* 1054)

29. Μαζός/μαστός: the breast, more frequently used for females (E. g. *Il.* 4. 528, 22. 80-84; Stesich., *Geryon.*, F1. 5 (Campbell, vol. 3) [=P. Oxy. 2617, fr. 11. 5]; A., *Ch.*, 531, 897)

30. 'Ασκός: the belly (Archil., F119 (*IEG*, vol. 1) [=Schol. E., *Med.* 679])
Γαστήρ: the belly (*e.g. Il.* 16. 163; *Od.* 17. 228, 559; Tyrt. F11. 24 (*IEG*, vol. 2) [=Stob. 4. 9. 16], the womb (Thgn. 1. 305; Pi., *P.* 4. 176)
Κοιλία: belly, cavity (*h.Cer* 117; *h. Ap.* 405)

31. Διξύς: the waist (*Il.* 10. 544, *Od.* 5. 231)
Μέση: the waist (Thgn. 1. 265)
Πρότμησις: the waist or the loins (*Il.* 2. 424)

32. Μέση γαστήρ: the umbilical region (*Il.* 4. 531, 13. 372, 368, 506)

33. 'Ομφαλός: the navel (*e.g. Il.* 13. 568), the area around the navel (*Il.* 4. 525, 20. 416, 21. 481)

34. Κενεών: the lower part of the abdomen and the flanks (*Il.* 5. 284, 11. 381, *Od.* 22. 294-295)
Νειαίρη γαστήρ: the lower part of the abdomen (*e.g. Il.* 5. 539, 5. 615-616, 18. 519)

35. Λαπάρη: the flank (*e.g. Il.* 3. 359, 7. 251-259, 22. 307; Epich., 90; Pi., *I.* 2. 22)
Πλεύρη/πλευρόν: the flanks (*e.g. Il.* 11. 435-437; Hippon., F104. 20 (*IEG*, vol. 10

[=P. Oxy. 2175, frs. 3 &4]; Pi. , *N.* 10. 131)

36. Αἰδοῖον: the genitals (*e.g. Il.* 13. 568, *Od.* 6. 129; Tyrt. F10, 25 (*IEG*, vol. 2) [=Lycurg. *Leocr.* 107 *de Spartanis*]; A., *Supp.* 491, *A*. 600, *Eum.* 705)
Μηδέα: the genitals (*Il.* 2. 340, 16. 120, *Od.* 18. 67; Hes. *Th.* 180. 398, *Op.* 54)

37. Βουβών : the groin, the inguinal region (*Il.* 4. 492)

Posterior aspect

38. Ὦμος: the shoulders (*e.g. Il.* 5. 621-622, 8. 194; *h.Cer.*, 279; *h. Ap.* 6, 450), the shoulder-blades or scapular region (*Il.* 5. 57, 110, 16. 807)

39. Μετάφρενον: the shoulders (Archil., F31 (*IEG*, vol. 1) [=Syn., *Laudation Calv.* 2p 75b-c]), the area between the shoulders (*e.g. Il.* 5. 40- 41, 56-57), the back (*e.g. Il.* 12. 427-428)

40. Νῶτον: the back, the area from the shoulders to the waist (E. g. *Il.* 5. 147, *Od.* 6. 225; Anacr., F388. 8 (Campbell, vol. 2) [=Ath. 12. 533 fr]; Pi. *N.* 6. 9. 62)

41. Ῥάχις: the lower part of the back (*Il.* 9. 207-208), the vertebral column (A., *Eu.* 190)

III. UPPER LIMBS

42. Γυῖον: upper and lower limbs (*e.g. Il.* 5. 122, 13. 61, 23. 627, 722; Ibic., F282 (Campbell, vol. 1) [=P. Oxy. 3538], Pi., *N.* 4. 8), genitals (*Il.* 24. 514)

43. Μέλος: the limbs (*e.g. Il.* 11. 668, 23. 191; Alcm. F3. 61 (Campbell, vol. 2) [=P. Oxy. 2387, fr. 3, col. ii]; Archil., F222 (*IEG*, vol. 1) [=*E. Gud.*, col. 390. 42]; Sapph., F46 (Campbell, vol. 1) [=Hdn, *Vers.* 2. 39])

44. Βραχίων: the upper limb (*Od.* 18. 68-69), the upper arm (*e.g. Il.* 16. 510, 13. 529-532; Hippon., F118 (*IEG*, vol. 1) [= P. Oxy. 2176])
Χείρ: the upper limb (*e.g. Il.* 20. 478-480; Pi., P. 10. 36), the hand (*e.g. Il.* 1. 323, 5. 309, 416-417, 13. 595; *h. Ap.* 535; Thgn. 1. 6, 980; Pi., *N.* 1. 69)

45. Ὠλένη: the forearm (*Il.* 1. 55, *Od.* 6. 186; A., *Pr.* 60)

46. Πῆχυς: the upper limb (*e.g. Il.* 5. 314; *Od.* 23. 240)

47. Ἀγκών: the elbow (*e.g. Il.* 10. 80, *Od.* 14. 485; Thgn. 1. 265)

Ἀγκύλη: Anacr. F415 (Campbell, vol. 2) [= Ath. 10. 427d]

48. Καρπός: the wrist (*e.g. Il.* 5. 458, 888, 8. 601, 18. 594, *Od.* 22, 277), the hand (Pi., *N.* 2. 96)

49. Καρπός χεῖρας: the palm (*h. Ap.*, 196)

50. Παλάμη: the hand (*e.g. Od.* 1. 104; Pi., *P.* 1. 94, 2. 40, *O.* 9. 39, 12. 73; A., *Supp.* 865)

51. Ἀγοστός: the palm (*Il.* 11. 425)

52. Θέναρ: the palm (*e.g. Il.* 5. 339)

IV. LOWER LIMBS

53. Ἰσχίον: the hips (*Il.* 8. 340, 11. 339)

54. Γλούτος: the buttocks (*e.g. Il.* 5. 66-68, 8. 340, 13. 651-652)
Κοχώνη: the buttocks, the perineum (Hippon., F151b (*IEG*, vol. 1) [=Erot, Com. on Hp *Epid.* 5. 7, fr. 17]

55. Τράμις: the perineum (Archil., F195 (*IEG*, vol. 1) Hippon., F114a (*IEG*, vol. 1) [both=Erot., π 13]

56. Σκέλος: the buttocks (*Il.* 16. 314), the limbs (Alc., F306 (Campbell, vol. 1) [=P. Oxy. 2307]

57. Ἄπυγος: without buttocks (Simon., F7. 76 (*IEG*, vol. 2) [=Stob. 4. 22. 193])

58. Μηρός/μηρίον: the thigh (*e.g. Il.* 15. 113, *Od.* 18. 67; Archil. F119, F205 *(IEG*, vol. 1) [=Schol. E., *Med.* 679] [=Ath. 688c]; Tyrt., F11. 23 (*IEG*, vol. 2) [=Stob. 4. 9. 16]; Anacr., F439 (Campbell, vol. 2) [=Hsch., 3. 1013])

59. Γόνυ: the knee (*e.g. Il.* 5. 176, 11. 579, 13. 360; Tyrt., F10. 19 (*IEG*, vol. 2) [=Lyc., F. 107]; Alc., F44. 7 (Campbell, vol. 1) [=P. Oxy. 1233, fr. 9])

60. Ἰγνύη: the bent of the knee (*Il.* 13. 212, 23. 726; *h. Merc.* 152]

61. Κνήμη: the lower leg (*e.g. Il.* 4. 146-147, 518-519, 10. 573; Tyrt., F11. 23 (*IEG*, vol. 2) [=Stob. 4. 9. 16])

62. Σφῦρον: the ankle /the malleola (*Il.* 4. 147; 578; 22. 397)
Γυῖα ποδῶν: the joints of the foot (the ankle?) (*Il.* 13. 512)

63. Πούς: the foot (*e.g. Il.* 7. 212, 8. 333; Alcm., F3. 10, F162 (Campbell, vol. 2) [=P. Oxy. 2387] [=P. Oxy. 2394, fr. 2]; Stesich., F222 (Campbell, vol. 3) [=P. Oxy. 2359, fr. 1]; Pi., *O.* 1. 95; 12. 49; *P.* 3. 107, 4. 170, 9. 16, 10. 36, *N.* 10. 90., 10. 119)

64. Ταρσός: dorsal aspect of the foot (*Il.* 11. 377, 388)

65. Πτέρνη: the heel (*Il.* 22. 396-397; A., *Ch.* 809)

66. Δάκτυλοι: the toes (Hippon., F104. 10 (*IEG,* vol. 10) [=P. Oxy. 2175, frs. 3-4]), the fingers (Sapph., F96 (Campbell, vol. 1) [=P. Berol. 9722 fol. 1]

V. INTERNAL ORGANS

67. Ἐγκέφαλος: the brain (*e.g. Il.* 3. 300, *Od.* 9. 458; Alcmeon* (Diels-Kranz 24 A13) [= Aët. 5. 3.3]; Anaxag.* F16 (Lonza) [=Plut., *Pericl.* 6]

68. Ἀσφάραγος: the trachea (?) (*Il.* 22. 328)

69. Πνεύμων/ πλεύμων: the lung (*Il.* 4. 528; Alc., F347 (Campbell, vol. 1) [=Procl., ad Hes. *Op.* 584];A., *Pr.* 881)

70. Πραπίς/ πραπίδες: the diaphragm or the lungs (*Il.* 11. 579, 13. 412), the breast, the heart (*e.g. Il.* 24. 514; Pi., *P.* 5. 90; A., *Supp.* 93)

71. Καρδίη/κραδίη: the heart (*e.g. Il.* 10. 94-95, 13. 282; *h. Cer.* 435; Archil., F25. 2 (*IEG*, vol. 1) [P. Oxy. 2310, fr. 1, col. 1]; Sapph., F31 (Campbell, vol. 1) [=Longinus, *de subl.*, 10. 1-3], A., *Cho.* 184)

Κῆρ/κέαρ: the heart (*Il.* 16. 481; Archil., F140. 3 (*IEG*, vol. 1) [=P. Oxy. 2313, fr. 6])

Ἦτορ: the heart (*e.g. Il.* 22. 452, 16. 480, 660; Stesich., *Geryon.*, F9. 5 (Campbell, vol. 3) [=P. Oxyr. 2617, fr. 42b]

Φρήν: the heart (*e.g.* Hippon., F36 (*IEG*, vol. 1) [=Tz., Scol. in Ar. *Pl.*, 87p30^{b} 1]; Alcm., F7 (Campbell, vol. 3) [=P. Oxy. 2389, fr. 1]; Stesich., F88 (*IEG*, vol. 3) [=P. Oxy. 2619, frs. 1, 47]; Pi., *O.* 7. 14), the diaphragm (?) (*Od.* 9. 301), "it envelops the heart" *(Il.* 16. 481)

72. Περικάρδιον: around the heart (Emp., F94 (Wright) [=Stob. 1. 49. 59]; Hippon (DK38 A10) [Phlp. 2. d. St. 92]

73. Δέρτρον: the membrane which covers the abdominal viscerae (*Od.* 11. 579)

74. Ἔγκατα: the entrails (the heart, lungs, liver, kidneys) (*e.g. Il.* 11. 438, *Od.* 9. 293)

Σπλάγχνα: the entrails (E. g. *Il.* 1. 464; *Od.* 3. 99; Hippon., F102. 9 (*IEG*, vol. 1) [=P. Oxy. 2175, fr. 1]; Simon., F12 (*IEG*, vol. 3) [=Choerob., *in Theod.* 1. 267. 10]; A., *A.* 1221),

the womb (Pi., *N.* 53)

῾Ενδινα: the entrails (*Il.* 23, 806)

75. ῾Εντερα/χολάδες: the abdominal viscerae (*Il.* 13. 506-508, 17. 313-31; A., *A.*, 1221)

76. ῾Ηπαρ: the liver (*e.g. Il.* 17. 349, 20. 469-470; *h. Cer.* 21; Arch., F234 (*IEG*, vol. 1[=Ath. 107 fr.]; A., *Pr.* 493-494; Emp. F147 (Wright) [=Plut., Quest. conv. 683e])

77. Κύστις: the bladder (*Il.* 5. 67, 13. 652)

78. ᾽Επινεφρίδιος: "around the kidneys" (Il. 21. 204)

79. Χολή: the bile (*e.g.* Archil., F234 (*IEG*, vol. 1) [=Ath. 107 fr.]; Stesich., *Geryon.*, F15. 4 (Campbell, vol. 3) [=P. Oxy. 2617, frs. 4 &5, col. ii]; Hippon., F73 (*IEG*, vol 1) [=P. Oxy. 2174, fr. 4]; A., *Ch.* 184)

VI. NERVES AND TENDONS

80. ῾Ινες: the tendons (*Il.* 18. 522, *Od.* 11. 219)

81. Νεῦρον: the tendons or the fibrous parts of a muscle (*Il.* 16. 316)

82. Τένων: the tendons

αὐχένα ... ἀπὸ δ'ἄμφω τένοντε: the tendons of the neck (*Il.* 10. 456, 14. 466, 16. 587, *Od.* 3. 449-450)

τένωντες ἀγκῶνος: the tendons of the elbow (Il. 20. 478-479)

πτέρναι τέντων: the tendons of the heel (*Il.* 4. 521; A., *Ch.* 809)

κοτύλην, πρὸς δ' ἄμφω τένοντε: the tendons of the coxo-femoral joint *(Il.* 5. 307)

VI. BLOOD VESSELS

83. Φλέψ: the blood-vessel (*Il.* 13. 545; A. Fr. 379 (Mette) [=*Et. Gud*]; Anaxag.*, F10 (Lonza) [=**Schol. in Greg**. 36. 911])

᾽Αγγεῖον: the blood-vessel (Anaxag. F16 (Lonza) [Plut. Pericl. 6]

84. Σαρκῶν σύριγγες: "channels of flesh", blood-vessels or pores (Emp.* F91 (Wright) [=Arist., *Resp.* 473a15])

85. ᾽Αρτηρίη: artery, although probably a late use (Anaxag.*, F10 (Lonza) [Schol. in Greg. 36. 9

VII. BONES

86. Ὀστέον: the bone
Ὀστέα κεφαλῆς: the "bones of the head" (the skull?) (*Il.* 11. 97, 12. 185, 384-385)

87. Κληῖς: the clavicle (*Il.* 22. 324)

88. Σφόνδυλος: the vertebra (*Il.* 20. 483)
Σφονδῆς: the vertebra (Hippon., F102 (*IEG*, vol. 1) [=P. Oxy. 2175, fr. 1]
Ἀστράγαλος: the vertebra (*Il.* 14. 465-466)

89. Ἰσχίον: the hip-bone *(Il.* 5. 305-307, 11. 339, *Od.* 17. 234)

90. Κοτύλη: the socket of the hip-bone, the "kotyle" (*Il.* 5. 306)

91. Μυελός: the moella (*e.g. Il.* 20. 482, *Od.* 9. 283; A., *A.* 76)

IV. SCULPTURE

The rendering of anatomy is a significant element in the debate about the existence of an Attic style in Archaic sculpture. It is also an important aspect in the identification of a sculptor or workshop's style in statuary dating from the late Archaic period[1] From that period and onwards, differences between regional schools gradually become less perceptible,[2] and statues may be assigned to sculptors, whose names are known from ancient sources and an increasing number of signatures.

Although the definition of regional and sculptors' styles was challenged in previous scholarship,[3] this chapter attempts neither to define an Attic style in sculpture,[4] nor to discuss attributions to sculptors or workshops. It aims to examine the rendering of anatomy and bodily poses in order to describe the progress towards naturalism. Once the typical

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[1] *E.g.* Deyhle, *AM* 84 (1969) 1-64; Floren J., Fuchs, W., *Die griechischen Plastik*, vol. 1, *Die geometrische und archaische Plastik* (Munich 1987) 295-300.

[2] About the development of an "International style", see Ridgway, *The Severe Style in Sculpture* (Princeton 1970) 6-7; *Archaic Sculpture*, 8-9.

[3] For a discussion of regional as opposed to chronological studies, Rolley, Cl. "L'espace ou le temps, points de vue sur la sculpture archaïque", *Formes* (1978) 3-12. Doubts about the existence of regional schools were cast, *e.g.* a Chiot workshop is called "an archaeological mirage" by Sheedy, K., "The Delian Nike and the search for Chian sculpture", *AJA* 89 (1985) 622, note 35; and on island styles, "An archaic sphinx from Siphnos", *BSA* 83 (1988) 369. For arguments against the recognition of individual's styles see, Bruneau, Ph., "Méthodologie de l'histoire de l'art antique", *AntCl* 44 (1975) 446-451.

[4] Ridgway thinks that the Attic style is the most distinctive of all (*Archaic Sculpture*, 71); other scholars challenge her definition and prefer to see Archaic Attic sculpture as a sum of different styles attributed to workshops or sculptors Croissant, *Protomés*, 27; Walter-Karydi, *Alt-Ägineten*, 10; Viviers, D., *Recherches sur les ateliers de sculpteurs et la Cité d'Athénes à l'époque archaïque. Endoios, Philergos, Aristoklès* (Brussels 1992) 29-31.

anatomical features are clarified, a few features which are different from the common rendering help to group material together, and may be then explained through the influence of regional schools, sculptors or workshop's style. The archaeological evidence is, therefore, selected by provenance and not by "style", while the architectural sculptures of two buildings at Delphi (the Temple of Apollo, and the Treasury of the Athenians) are also included because they are connected with the city of Athens or Athenian families who commissioned them according to ancient texts.[5]

Sculpture is divided into three sections following the material: stone, bronze, and terracotta. Media of different size are grouped together and differences which may appear between large and small-scale statuary in the rendering of the human figure are noted and explained at the end of each section. Within these sections, two subdivisions are made, anatomy (PART 1) and poses (PART 2). PART 1 studies the rendering of hair-style, face and body; PART 2, the development of motion, ponderation and lifelike poses. In conclusion, the representation of the human figure in the three media is compared, and the influence of the technique (carving, casting, moulding, and modelling) examined.

As has been noted the thesis follows the conventional chronology. In sculpture, there are three valuable landmarks - the Siphnian Treasury (*ca.* 530-525), the Temple of Apollo (after 514/513), and the Athenian Treasury (after 490) at Delphi - and it seems prudent to explain why I accept these dates.

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[5] The pediments of the Temple of Apollo at Delphi were donated by the Alkmaeonidae (Hdt. 5.62, 10-15); the Athenian Treasury was dedicated by Athens with the spoils of Marathon (Paus. 10.11.5).

The Siphnian Treasury was dated *ca.* 530-525 following Herodotus, who mentions an adverse oracle given to the Siphnians while they were building their treasury at Delphi,[6] and which was fulfilled in a Samian attack dated to 525 by its connection with Kambyses' attack on Egypt.[7] This date is not discussed since it is acknowledged as the "best fixed point in all the history of Greek art",[8] and recent scholarship made a convincing rebuttal of the redating proposed by Francis and Vickers.[9]

The Temple of Apollo at Delphi is provided with a *terminus post quem* (514/513), since, according to ancient sources, the Alkmaeonidae undertook its building after the murder of Hipparchos (514/513) and their defeat in the battle of the Leipsydrion (514/513).[10] A *terminus post quem* is also given by Pausanias for the Athenian Treasury, which, according to him, was built with the spoils of Marathon.[11]

These dates have been challenged. Some scholars regard the style (rendering of anatomy, poses and drapery) of the Temple of Apollo too old for the date suggested by Herodotus. They compare it with that of the Gigantomachy pediment in the Athenian

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[6] 3.57-58. Its identification is supported by Pausanias 10.11.2.

[7] Hdt. 3.39-60. The Egyptian campaign took place in the fifth year of Kambyses' reign (525), see Richter, *Kouroi*[3], 114-115.

[8] Harrison, E.B., *Archaic and Archaistic Sculpture. The Athenian Agora* 11 (Princeton 1965) 5.

[9] They date the Treasury to the 470s, *JHS* 103 (1983) 54-59. For a reply, see Boardman, J., "Signa tabulae priscae artis", *JHS* 104 (1984) 161-163, and Amandry, *BCH* 112 (1988) 591-609.

[10] Hdt. 5.62.10-19; Ar., *AP.* 19.3-5. Some scholars accept the date for both building and pediment: *e.g.* de La Coste-Messelière, P., "Les Alcméonides à Delphes", *BCH* 70 (1946) 271-287; Weickert, C., *Typen der archaischen Architektur in Griechenland und Kleinasien* (Augsburg 1929) 142-144; Others, either for the poros and marble pediments (Stewart, *Sculpture*, 87), or only for the marbles (Gauer, W., "Weihgeschenke aus der Perserkriegen", *IstM* suppl. 2 (1968) 130-133).

Acropolis and assign to the Temple of Delphi a date either close to or earlier than that of the Athenian pediment.[12] However, the date of the Acropolis Gigantomachy is also discussed since it relies on stylistic grounds which are not confirmed by external evidence.[13] It cannot, therefore, be used to refute information provided by ancient sources, which are quite secure.[14] In addition, the style of the Delphic pediments may be due to the sculptor and does not necessarily indicate an early date.[15]

A date around 490 for the Athenian Treasury cannot be excluded. Following the discovery of a pedestal built against the south side of the Treasury bearing an inscription about Marathon, and given the style of the marbles themselves which may suggest a date varying from *ca.* 510 to 490, several scholars thought that Pausanias probably read the

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[11] 10.11.5

[12] Payne, H., Young, G.M, *Archaic Marble Sculpture from the Acropolis* (London 1936), 64. Deyhle, *AM* 84 (1969) 43. Childs, A.P., "Herodotos, Archaic chronology and the Temple of Apollo at Delphi", *JdI* 108 (1993) 419-441.

[13] For a date *ca.* 510 see, Childs, A.P., "The date of the old Temple of Athena on the Athenian Acropolis", *The Archaeology of Athens and Attica under Democracy*, eds. Coulson, W.D.E., Palagia, O., Shear, T.L., Shapiro, H.A., Frost, F.J. (Oxford 1992) 1-6; For a conventional date (*ca.* 520), Stähler, K., "Zur Rekonstruktion und Datierung des Gigantomachiegiebels von der Akropolis", *Antike und Universalgeschichte, Festschrift Hans Erich Stier* (Münster 1972) 88-113. Croissant, F., "Observations sur la date et le style du fronton de la Gigantomachie Acr. 631", *REA* 95 (1993) 61-77.

[14] For an extensive list of literary sources about the Temple of Apollo, see Homolle, Th., "Monuments figurés de Delphes. Les frontons du temple d'Apollon. II. Histoire des frontons d'aprés les textes littéraires et les documents numismatiques", *BCH* 26(1902) 587-627.

[15] The pediments were usually assigned to Antenor who was said to carry out an "old attic" style in his works: *e.g.* de La Coste-Messelière, "Les Corés de l'Acropole", *JSav* (1942) 64; Deyhle, *AM* 84 (1969) 41-43. Rolley, Cl., *La sculpture grecque*, vol. 1, *Des origines au milieu du Ve siècle* (Paris 1994) 198-199.

inscription on the base and assumed that it also applied to the neighbouring building. [16] Yet, the style of the marbles, their subject, and the architecture of the Treasury do not contradict the post-Marathonian date. In other words, as noticed by de La Coste-Messelière, "il s'agit de savoir, non pas si une date antérieure (à 490) de 10 à 15 ans serait en soi plausible, mais bien, si la référence (à Marathon) est inacceptable".[17]

In fact, for both buildings, the style alone cannot justify the rejection of dates deduced from literary sources since there is no decisive argument contradicting them and no other evidence which may provide a certain absolute date.

A. SCULPTURE IN STONE

1. ANATOMY

In the last decades of the sixth century, new hair-styles, which seem to reflect contemporary fashion, were introduced in male statuary. Hair, previously worn long and loose, is styled in a chignon over the nape of the neck. The coiffure, which combines rolled hair with several rows of snail curls over the forehead, [18] and that in which hair loops under a fillet and spills over it, seems to have become popular during this period and disappears gradually after the Persian Sack. Both coiffures recall hair-styles seen on contemporary

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[16] Different dates have been proposed: the last decade of the sixth century (Dinsmoor, W.B., "The Athenian treasury as dated by its ornament", *AJA* 50 (1946) 86-121); the first decade of the fifth century (Harrison, *Athenian Agora* 11, 9; Boardman, J., *Greek Sculpture. The Archaic Period*[2] (London 1991), 28).

[17] *Sculpture du Trésor des Athéniens, FD* IV,4 (Paris 1957) 260.

Achaemenid reliefs,[19] and probably point to an Eastern influence on Attic fashions,[20] also acknowledged for clothing.[21] Similarly, their gradual disappearance echoes a change in Athenian fashion from *ca.* 480 as is also attested by literary sources. According to Heraklides Pontikos, the κόρυμβος or κρωβύλος,[22] was sported by the victorious warriors at Marathon,[23] while Thucydides reports that, in his days, it was worn by old people only.[24] From the 480s, another kind of chignon becomes popular: hair is rolled up around the forehead and the neck. It occurs on a few marbles, such as the robber (**S68i**) (pl. 104), the Kritios Boy (**S32**) (pls. 35-39), a fragmentary head from the Acropolis (**S20**) (pl. 16, 2), but also outside Attica, on a kouros from Agrigento,[25] Aktaion on a metope of the Temple C at Selinus,[26] and on several small scale bronzes dated to the first and second quarters of the fifth centuries.

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[18] **S29, S33, S38, S53, S54, S68k, S68m** (pls. 10; 29-30; 44, 1; 59; 60; 72; 75).

[19] *E.g.* for the first coiffure, two attendants of Darius on the Behistun Monument securely dated to 525-518, see Farkas, A., *Achaemenid Sculpture* (Istanbul 1974) 53, for the second, see Ridgway, *Archaic Sculpture*, 60.

[20] Markoe, G.E., "The forehead snail curl in Greek sculpture: a chronological study", *A Paper presented in the 89th General Archaeological Meeting*, abstract in *AJA* 92 (1988) 273.

[21] For a gradual infiltration of East Greek habits into Athenian komast life around the last quarter of the sixth century - introduction of a turban, boots and barbiton in the representation of male komasts - see Boardman, J., Kurtz, D.C., "Booners", *GV J PaulGettyM* 3 (1986) 5-70.

[22] For literary sources about both names, "Haartracht und Haarschmuck", *RE* 2120-2121.

[23] Ath., *Deipnosophistae* 12.512 A-C[= Heraclid. Pont.] who describes the life of Athenians: ...κορύμβους δ'ἀναδούμενοι τῶν τριχῶν χρυσοῦς τέττιγας περὶ το μέτωπον και τὰς κόρρας ἐφόρουν ... καὶ τοιοῦτοι ἦσαν οἱ τὴν ἐν Μαραθῶνι νικήσαντες μάχην".

[24] I.6

[25] Agrigento, Museo Civico, Richter, *Kouroi*[3], no 182, 145-146, figs. 547-549; Richter's Ptoon Group (500-480); Ridgway dates it around 470 (*SS*, 60); and Langlotz as late as 460, "Die Ephebenstatue in Agrigento", *RM* 58 (1943) 204-212; see *Sikaniè. Storia e civiltà della Sicilia Greca*, dir. Pugliese Caratelli, G. (Milan 1985), fig. 238.

In previous scholarship, some of the new hair-styles were considered to reveal a characteristic aspect of the figure - its age, identity, or an activity he may practise. From the last quarter of the sixth century, short hair become popular,[27] and following literary descriptions which report that the young *epheboi* cut off their forelocks[28] or knots[29] to offer them to the divinity during the κουρεῶτις ἡμέρα,[30] or the οἰνηστήρια[31], some scholars suggest that the differing lengths of hair over the male forehead or the nape of the neck may occasionally reflect the age of the subject. It would, therefore, show either a pre-adolescent (long), or adolescent and adult age (short).[32] For practical reasons, short hair was also described by ancient texts as suitable for wrestlers,[33] other athletes,[34] and slaves,[35] and, in

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[26] *Ca.* 460: Fuchs, W., "Zu den Metopen des Heraion von Selinus", *RM* 63 (1956) 102-121; Holloway, R.R., *Influences and Styles in late Archaic and early Classical Sculpture and Magna Graecia* (Louvain 1975) 22-23.

[27]**S34, S38, S39, S53, S59, S60, S63, S64, S68u, S72** (pls.39,2; 44-45; 59; 63; 69; 86; 93; 116; 118).

[28] Plut., *Thes.* 5.1.

[29] *E.g.* A., *Ch.* 6.

[30] *E.g.* Hsch, *Lexikon*, *s.v.* κουρεῶτις. Poll., *Onomastikon*, 8.9.107.

[31] Poll., *Onomastikon* 6.322. Ath., *Deipnosophistae* 11.494F, s.v. οἰνηστήρια. Hair cutting as cult practice also D.Chr, *Orationes* 35.67R.

[32] Harrison, "Greek sculptured coiffures and ritual haircuts", *Early Greek Cult Practice: Proceedings of the Fifth International Symposium at the Swedish Institute*, eds. Hägg, R., Marinatos, N., Nordquist, G.C. (Athens 1988) 250.

[33] E., *Ba.* 455.

[34] Lucianus, *DMaretr* 5.3: καὶ ἐν χρῷ ὤφθη αὐτὴ καθάπερ οἱ σφόδρα ἀνδρώδεις τῶν ἀθλητῶν ἀποκεκαρμένη. Philostr., *Im.* 2.32.

[35] Arist, *Rh.* 1367a. 9. 27: ἐλεύθερον γὰρ σημεῖον οὐ γάρ ἐστιν κομῶντα ῥᾴδιον οὐδὲν ποιεῖν ἔργον θητίκον (long hair is the mark of a free man because it is hard to do servile manual work with long hair).

previous literature, statues with a similar coiffure were thought to portray athletes.[36] In a similar manner, Neils followed by others, regarded the hair roll and head ring of the Kritios Boy, as a rare kind of hair-style, which identifies him as a hero, namely Theseus.[37]

A close analysis suggests that these coiffures follow contemporary fashion. They do not usually provide further information about the figure in marble. Short hair is not worn only by adults, but short forelocks and even short hair are seen on children portrayed on a few stelai, whose youth is identified by other elements such iconography (**S60**) (pl. 93, 1), or small size (**S11, S33**) (pl. 4, 2). Additionally, long hair over the forehead is not the attribute of the young. Hair bound up over the forehead may be seen on both young males, such as the Kritios Boy (**S32**) (pl. 38),[38] and bearded mature men, such as the robber on the Athenian Treasury (**S68i**) (pl. 103). As regards short hair related with an athletic activity, it is probably significant that the earliest known examples appear on marbles dated to the third quarter of the sixth century, which are contemporary with the earliest dated statues of athletes mentioned in ancient sources. Although the early extant figures in marble with short hair cannot with certainty be seen as athletes,[39] it is likely that short hair-styles usually worn in the *palaistra* become in fashion outside the gymnasium as soon as athletes were praised and commemorated

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[36] See Buschor, E., *Frühgriechische Jünglinge* (Munich 1950) 99, 103; Karouzos, Ch., *Aristodikos. Zur Geschichte der spätarchaisch-attischen Plastik und der Grabstatue* (Stuttgart 1961) 44.

[37] Neils, J., "The quest of Theseus in Classical sculpture", *Acts of the Twelfth International Congress of Archaeology. Athens 4-10 September 1983*, vol. 2 (Athens 1988) 155-158.

[38] Hurwit notices that the young age of the Kritios Boy is shown by the fleshy rendering of his face and anatomical features, see"The Kritios Boy: discovery, reconstruction and date", *AJA* 93 (1989) 68, note 103.

for their victories. This coiffure may be, therefore, associated with athletes (some athletes in **S53a** and **c**) (pls. 60-63; 70), but also with other types of figures, such as (**S17, S34**) (pls. 11; 39, 2. The iconographical parallels of the Kritios Boy's coiffure with other representations of Theseus are not convincing. The hair-styles of the pedimental Theseus from Eretria,[40] or that of Theseus on the Brygos Painter's cup at the Louvre,[41] mentioned by Neils are not strictly comparable.[42] Both the Theseus, from Eretria and that on the Brygos Painter's cup, display locks over the forehead combined with hair rolled up over the nape of the neck, while the Kritios Boy has all his hair rolled up. And although a coiffure exactly like his is hard to find, we have seen that it occurs in a few marbles and bronzes usually dated to the second quarter of the fifth century, and therefore reflects a contemporary fashion rather than the heroic identity of the figure. In fact, what is, indeed, exceptional in the Kritios Boy hair is not the coiffure but the sculptor's technique which probably shows the influence of bronze statuary. Strands radiate from the centre of the crown and look as if they were engraved or chased as much as carved";[43] the locks are wrapped individually over the circlet and deeply drill-cut so "as to approximate the effects of certain bronze hair-styles in which individual locks were cast

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[39] I am not convinced that the Rayet head (**S64**) (pl. 93, 2) portrays an athlete as suggested by Ridgway, B.S, "Of kouroi and korai, Attic variety", *Hesperia*, suppl. 20. *Studies in honnor of H.A. Thompson* (1982) 118-122. See about this question, 89-91.

[40] Chalkis, Archaeological Museum A, Stewart, *Sculpture*, vol. 2, fig. 236.

[41] Paris, Musée du Louvre G195, *ARV*^{2} 381, 174; *Add*^{2} 227, see Brommer, F., *Theseus: die Taten des griechischen Helden in der antiken Kunst und Literatur* (Darmstadt 1982), pl. 46a-b.

[42] Neils, *Acts of the Twelfth Int. Congr. of Arch*, vol. 2 (1988), 156.

[43] Hurwit, *AJA* 93 (1989) 67.

separately";[44] and curls and wisps of hair cling to the neck in low relief. Only a bronze maker, or a marble sculptor trying to rival that other medium, would have styled the hair with these features since nearly identical hair rendering is found only on roughly contemporary medium scale bronze heads.[45]

From the last quarter of the sixth century, a slight move away from the impersonal representation of the male figure in the round may be, however, seen in a distinctive carving. The roughly finished skull cap suggests that, in some cases, a hairdressing - a cap or a helmet- typical of athletes or warriors was worn,[46] and that the statue portrays an athlete or a warrior.

This rendering was alternatively explained as a preparation for fixing colour,[47] or stucco,[48] or as a surface which suggests short hair or a cap, or which was intended to be covered by a helmet or a cap.[49] The two first hypotheses cannot be valid. A rough finish is not necessary to fix the colour on the surface of the marble since paint is also applied to a smooth

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[44] Adam, S., *The Technique of Greek Sculpture in the Archaic and Classical Period* (London 1966) 46.

[45] Acropolis Museum (**B20,** pl. 137) and a youth (*ca.* 470): Castelvetrano, Town Hall, Richter, *Kouroi*[3], no 192a, 157, figs. 651-656.

[46] Athletes may wear a cap, see contemporary vases, Eckstein, F., "Athletenhauben", *RM* 63 (1956) 90-95; and warriors may also wear one to protect their head from the helmet, see for example the wounded Patroklos on the Berlin cup (**V22, I**) (pl. 176, 1), and discussion by Berger, E., *Das Basler Artzrelief. Studien zum griechischen Grab und Votivrelief um 500 v. Chr. und zur Vorhippokratischen Medizin* (Mainz 1970) 92-97; and Ridgway, B.S, "Birds, 'meniskoi' and head attributes in Archaic Greece", *AJA* 94 (1990) 594.

[47] Karouzos, *Aristodikos*, 6.

[48] Strokka, V.M, "Aphroditekopf in Brescia", *Jdl* 82 (1967) 110-156. Blümel, C., "Stuckfrisuren an Köpfen griechischen Skulpturen des sechsten und fünften Jahrhunderts vor Chr.", *RA* (1968)11-24.

[49] Knigge, U., "Ein Jünglingskopf vom Heiligen Tor in Athen", *AM* 98 (1983) 54-55. Ridgway, *AJA* 94 (1990) 590-599.

marble surface.[50] Additions in plaster also seem improbable. The application of stucco was used in Hellenistic Alexandria where marble, not locally available, was at a premium, a situation different from that in Attica.[51] Moreover, traces of polychromy, found on a few heads, indicate that the marble was at least visible.[52]

As far as the attachments of helmets or caps are concerned, a distinction must be made between figures with the whole head roughly picked,[53] and figures with roughness limited to the top of the head and bordered by two rows of locks over the forehead and the nape of the neck,[54] both of which were popular in the late sixth and early fifth century.[55] For the first group, an added helmet or head cover must be excluded since there is no evidence of metal attachments. The roughening was deliberate in order to suggest crimped short hair, as on the moustache and beard of **S72** (pl. 118, 2) and of the "Sabouroff head". It points to the

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[50] *E.g.* the locks of (**S59**) (pl. 89), and strands of the korai (**S21, S22, S23, S24**) (pls. 17, 1; 18, 1; 19-20).

[51] Robertson, *History of Greek Art* (Cambridge 1975) 98.

[52] See Robertson, *(HGA*, 90) who, unlike Blümel, C., (*Katalog der griechischen Skulpturen des VI. und V. Jahrhunderts vor Chr.*, vol. 1 (Berlin & Leipzig 1940) 7) did not think that remains of colour on the marble were due to the stucco impregnated with it and which left traces on the rough surface.

[53] (**S60, S72**) (pls. 93, 1; 118, 2), and of unknown provenance and not in the catalogue: "The Sabouroff head", Berlin, Staatlichen Museen SK 308, Blümel, *Katalog*, vol. 1, 6-7, pls. 13-15. For its attribution to an Aeginetan workshop, Walter-Karydi, *Alt-Ägina*, II, 2, 75-76. Head of a youth with inlaid eyes, New York, Metropolitan Museum of Art 12.59, Richter, G.M.A., *The Metropolitan Museum of Art. Handbook of the Classical Collection*[3] (Cambridge Mass. 1953) no 22, pl. 22 fig. c. Youth with a horse, Malibu, J. Paul Getty Museum I-75, Moore, M., "The Cottenham relief", *J Paul GettyMJ* 2 (1975) 38-46.

[54] **S15, S39, S59, S63** (pls. 45, 87).

[55] This distinction is also suggested by Schäfer, Th., "Gepickt und Versteckt", *Jdl* 111 (1996) 25-69.

sculptor's preference for this technique "which involves an economy of carving".[56] Its combination with other distinctive anatomical features will help to group some marbles together and assign them to the same workshop.[57] In the second group - rough calotte bordered with locks - the roughly picked surface cannot represent short crimped hair since on other contemporary marbles, the several rows of snail locks usually border long strands of hair and hence exclude the possibility of very short hair combined with locks on the forehead and the nape of the neck. It certainly portrays a head cover although, at first sight, it is difficult to say whether this picked surface was covered by an additional head-gear (helmet or cap), or whether it represents the head-dress itself. All works display holes for metal attachments but their size and number varies and they were not all used to fix head-dresses. Single and small metal pins were probably used only as bird repellents or *meniskoi*[58] since they occur on calottes which still bear traces of colour and must have been visible.[59] In these marbles, the rough surface probably represents a knitted cap such as Patroklos' on the Sosias Painter's cup

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[56] The bronze wig and bronze covering of the moustache suggested by Schäfer, *JdI* 111 (1996) 57-59 are difficult to accept since there were traces of bronze gilding neither on the moustaches of the sculptures in the round nor on the reliefs. The traces he mentions on the head from Herakleia on the Pontos (Ankara, Museum 19367, Akurgal, E., "Neue archaische Skulpturen aus Anatolie", *Archaische und Klassische Griechische Plastik. Akten des internationalen Kolloquiums von 22.-25. April 1985 in Athens*, ed. Kyrieleis, H., vol. 1 (Mainz am Rhein 1986) 9, pl. 4,5) could be both colour or bronze gilding, and, in any case, were not preserved on the picked surface of the beard but on the smooth one of the head-gear.

[57] See 108-109

[58] Maxmin, J., "Meniskoi and birds", *JHS* 95 (1975) 175-180.

[59] "A single metal-pin and traces of colour on: **S59** (pl. 86) (Karouzos, *Aristodikos*, 6. I could not check personally in the museum of Athens), **S66** (Comstock, M.B, Vermeule, C.C, *Sculpture in Stone. The Greek, Roman and Etruscan Collection of the Museum of Fine Arts, Boston* (Boston 1976) 7). Outside catalogue, Paris, Musée du Louvre Ma 3105 (Hamiaux, M., *Les sculptures du Louvre*, vol. 1 (Paris 1992) no 82, 91)

(**V22,** pl. 176,2) mentioned earlier (note 46). On the other hand, one large,[60] or several attachment holes,[61] must have been used to attach a metal helmet since they belong to roughly picked calottes without any traces of colour; on these, the lack of colour is not due to bad preservation, since they still display well-preserved colours in other areas, such as locks, beard, face and dress.[62] It is, therefore, clear that when the roughly picked calotte is combined with a row of locks over the forehead and the nape of the neck, it suggests the existence of a head cover, painted or attached, which is an attribute of the figure. The naked kouros is not only identified as a warrior or an athlete by the inscription, but also by another element (a helmet or a cap) which belongs to the carved representation.

Less variety may be seen on female hair-styles. Hair is usually worn long and loose over the shoulders, and diversity occurs mainly in the dressing of the hair over the forehead. The strands may be gathered in a sweep before the ears (**S22,**) (pls. 18, 1), straight and bordered by curls (**S21, S23**) (pls. 17, 1; 19), or brought across the forehead in one mass to dip over each temple.[63] Another coiffure is introduced on female heads: several rows of snail locks over the forehead, sometimes combined with a chignon over the nape of the neck.[64] It is

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[60] **S15.**

[61] Four holes and a central dowel hole on a head of a youth found in Sicily, at Mozia: Marsala, Museo Archeologico, *La Statua Marmorea di Mozia, Studi e Materiali* 8 (1986), pls. 1-9.

[62] **S15**: Eaverley, M.A, *Archaic Greek Equestrian Sculpture* (Michigan 1995) no 10, 106-107. For traces of colour on the statue from Mozia: Falsone, G., *La scoperta, lo scavo e il contesto archeologico, la statua marmorea di Mozia, Studi e Materiali. Instituto di Archeologia. Universite di Palermo. Atti della giorno di Studio, Marsala 1 June 1996,* 8 (1986) 27.

[63] **S18a, S25, S27, S28** (pls. 14, 1; 21-22, 26, 28). Boardman, *GSAP*, 86.

[64] Two late sixth century examples, **S26** (pl. 25) and Athens, Acropolis Museum 660, Richter, *Korai*, no 10c, 68, figs. 328-335, other fifth century examples, **S68c, S68m, S69** (pl. 118, 1).

similar to that noticed, at about the same time, in male statuary, and probably reflects a fashion common to both.

Hair-styles do not help to identify a distinctive function of the figure (athletic or military). Their diversity on marble statuary reflects that of contemporary fashion in Athens, which was further developed by the sculptor to enhance the qualities of the figure, since, according to ancient literature, gods, heroes, courageous warriors and beautiful women were praised for their beautiful hair.[65]

Naturalism is difficult to achieve when carving hair in marble. Ridgway notes, "of all the human features, hair is the most elusive and can be rendered only by approximation in sculpture, either by being impressionistically blocked out as an undetailed mass or by being converted into a pattern which necessarily tends to look abstract and decorative".[66] In the later decades of the sixth century, however, distinctive hair patterning is developed which suggests more succesfully the natural appearance of strands and knots. This is achieved by carving techniques which reflect the influence of bronze and bronze engraving and the taste of some sculptors for imitating them in order to enhance naturalism in the rendering of strands and locks .

Locks which usually fringe the forehead and the nape of the neck are carved in the shape of snails, while on two known examples,[67] Herakles has his curly short hair and beard

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[65] See 45.

[66] *Archaic Sculpture*, 61.

[67] **S68u** (pl. 116), and Athens, Agora Museum S1295 (not included in the catalogue because occasionally considered an Archaistic work), see Harrison, *Athenian Agora* 11, 37-40, pl. 18; and an archaistic marble because of the shape of its eye by Schuchhardt, N.H., "Review of Richter's *Catalogue of Greek Sculpture in the Metropolitan Museum of Art*", *Gnomon* 30 (1958) 485.

represented in relief beads. In the extant material (marbles, bronze, terracottas, and vases), dots and beads in relief covering the head and beard are exceptional, and are only seen on Herakles. The other known examples appear on two vases attributed to the Andokides Painter,[68] on which the hero is portrayed with locks in relief dots covering his head and beard, while on other contemporary vase-painting figures, relief dots are limited to the forehead and the nape of the neck. It is likely that this uncommon hair-rendering, related to Herakles, points to a unique model for both marbles and vases, probably a large scale bronze, since beads and dots in relief are easily cast and add separately on bronze heads.[69] The influence of bronze working was already acknowledged for the Kritios Boy: the individually cut strands, and the curls and whisps which cling to the neck are very difficult to achieve in marble while they can be easily suggested when engraved on bronze. It is also significant that at about the same time some heads in marble have bronze or marble strands and locks attached separately.[70] This process is typical of large-scale bronze statuary in which small details may be added on the attached pieces when cast separately. Spiral curls, wavy strands or relief snail locks added to marble heads may have appeared too heavy when carved in marble, and, for this reason, were sometimes made in bronze to be shaped more easily and with greater naturalism before being attached onto the marble.

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[68] **V15, V79** (pls. 176, 1; 194).

[69] See B. Bronzes, 123.

[70] On the nape of the neck of **S69, S20** (pls. 118, 1; 16, 2) Dickins, *Catalogue*, vol. 1, 194-195; and Ridgway, "Stone and metal in Greek sculpture", *Archaeology* 19, no 1 (1966) 38-39, figs. 24-25; outside Attica, a dying warrior from the east pediment of the Temple of Aphaia at Aegina had a few curls made of lead, still attached to the marble at the moment of its discovery (see Ridgway, *Archaeology* 19, no 1 (1966) 42).

On marbles dated to the last quarter of the sixth century, human anatomy is still partly suggested in decorative and inaccurate features. On the face, the volumes of the cheekbones and chin are emphasized, and the transition from the lips to the cheeks, although smoother, is still suggested by slight separating grooves. On the male torso, the muscular divisions of the abdomen are suggested in ovoids, which is a more decorative than naturalistic pattern (*e.g.* **S17, S18b, S49, S53a, S55, S57**) (pls. 11; 13; 55-56; 60-61; 63; 71-73; 76-77; 83). An ornamental star-shaped or triangular form is also given to the pubic hair.[71] Upper limbs, flexed or extended, may be in pronation, supination or demi-pronation, but still display anatomical mistakes: an arm in supination may be combined with a hand in pronation or semi-pronation, an arm in semi-pronation with a hand in forced pronation, and some figures are depicted with two left hands (**S53a**) (pl. 64).[72] Hands, when preserved, are flat with long square-shaped fingers, on which, joints are not often marked (**S6, S11, S17, S46**) (pls. 2, 2; 4, 2; 11, 1; 51). The shape of the feet is not accurate. It is often elongated, with a flat vault and dorsum, and the articulation of the joints and metarsal bones of the toes are rarely rendered.

Yet, occasionally, a more accurate rendering of human anatomy can be noticed, and, in particular, muscles, neglected until this period,are indicated. On the head, the ears usually have the tragus outlined (**S22, S24**) , and on the face, the eyes, often almond-shaped with a heavy upper eyelid, have the lacrymal caruncle indicated. On the anterior aspect of the male torso, ribs are occasionally represented (**S8, S38, S53 a & c**) (pls. 3, 2; 44; 61; 72). The four horizontal divisions of the stomach muscles (rectus abdominis) (still on **S35, S55**) (pls. 40, 2;

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[71]For a detailed study of the development of this pattern see Karouzos, *Aristodikos*, 76-89.

[72]Two left hands were noticed by Philadelpheus A., "Bases archaïques trouvées dans le mur de Thémistocle à Athénes" *BCH* 46 (1922) 13.

76) are reduced to three (including that below the pit of the stomach), which is the natural number, and form four globular masses on both sides of a median line (linea alba). The navel is set at the intersection of the lower abdominal divisison, while on earlier works it was often placed in the area below. Lower limbs display more regularly the depression of the lateral sides of the buttocks (depression of the great trochanter), and sculptors suggest the different levels of the lateral and medial inferior borders of the main muscles of the thigh (vasti), and those of the ankle bones (malleola). On both upper and lower limbs, the main muscles (biceps on the upper arm, brachioradialis on the forearm, *vasti* on the thigh and gastrocnemius on the calf) progressively acquire volume (see *e.g.* **S42**, pl. 48; **S53a**, pl. 67).

From the turn of the century, decorative forms gradually disappear. Anatomical features, closely observed, are represented with even greater naturalism, and further anatomical details are added. On the head, the ear has the tragus and antitragus indicated,[73] and a superior depression (the *triangular fossa*) is noticed on few marbles dated to the 480s (**S28, S29, S32**) (pls. 28-29, 38). On the face, the eye is suggested with a lacrymal caruncle and the inner canthus, usually missed on earlier marbles, is carved.[74] The depression of the eyesockets, and the volume of the cheekbones and chin are less marked; the lips, usually drawn down, rarely display the Archaic "smile" and the transition between them and the cheeks is gradual. On the male torso, the four globular masses of the abdomen are suggested in irregular squares close to their natural form,[75] while ovoid patterns become rare.[76] The interdigitations of the muscles

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[73] The antitragus is added in some earlier statues (**S22, S24, S25**) (pls. 17, 2; 20; 22) but remains exceptional.

[74] Only two earlier examples are known to me: **S22** (pl. 18, 1); **S25** (pl. 121).

[75] **S31, S32, S36, S68g-l-s** (pls. 33, 36, 41, 102, 110, 113).

[76] **S55, S68m, S68u** (pls. 76, 99-100; 115).

(serratus magnus and external oblique) are regularly carved on the lateral inferior part of the chest.[77] The inferior part of the stomach, and with it the pubic area, adopt a natural form: they become wider, while the flanks narrow. The feet of both female and male figures are less elongated, and their volume modelled according to that of the skeleton (compare (**S11**, pl. 5, 1) and (**S18**, pl 15, 2) with **S59**, pl. 92). The toes have a more accurate shape and the joins are marked (**S9, S28**) (pl. 4, 1).

The earliest known examples of figures with blood vessels are dated to the first quarter of the fifth century (**S53c, S68j-u**) (pls. 70-74; 109-111),[78] although it is possible that they were already indicated on the human body from the late sixth century as they are on some contemporary horses.[79] The rendering of veins reflects a close observation of the human body on the part of the sculptors since it is the most prominent vessels which are carved on areas where they can be clearly seen - upper and lower limbs, hands, and foot.[80] Sculptors start to outline them on the points of flexion and indicate the 'v' pattern formed by two blood vessels at the level of the elbow on arms in supination or demipronation (**S68u**) (pl. 117),[81] and an

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[77]**S48, S52, S68a-q-u** (pls. 53, 113). It is sometimes difficult to distinguish between the interdigitations of the muscles and the subcutaneous border of the ribs which probably occur on (**S14, S36, S68m**) (pls. 8, 41); for this see also, Richter, *Kouroi*[3], Ptoon 20 Group, 133; and *F.D.* IV, 4, 20.

[78]For a detailed description of the veins on figures from the Athenian Treasury, see *F.D.* IV, 4, 58, 202.

[79]For equine anatomy, see Markman, S.D., *The Horse in Greek Art* (Baltimore 1943) 60-66. The veins of the belly and legs occur already on horses from the Siphnian Treasury, South and West friezes: *F.D.* IV, *Sculpture*, pls. VII-IX. Horse from the Acropolis: Athens, Acropolis Museum 700, Eaverley, *Equestrian Sculpture*, 112-114.

[80] For the veins visible on the surface of a human body, (see pl. 300).

[81]The median cephalic and median basilic.

oblique swelling around the elbow of an arm in pronation on (**S53c, S68j**) (pls. 74, 107).[82] On slightly later works, such as the figures from the east pediment of the Temple of Aphaia (*ca.* 480),[83] they also suggest the superficial vein of the neck (jugular vein), and those of upper and lower limbs, foot and hand.[84] Blood vessels are indicated only on male statuary, probably because they appear more clearly on muscular bodies. According to physicians, veins are more visible either on the body of very thin subjects, or of those used to violent bodily exercises.[85] Thin subjects were not represented in late Archaic Greek sculpture and were developed only from the Hellenistic period, while athletic qualities were prized for males and not for females.

In depicting veins, sculptors do not reflect medical or philosophical discussions about "the 'nutritive' function of blood and air in the respiration,[86]... or about a specific human anatomical characteristic of opposite flexion of the joins,[87] ... or about the difference between male and female, lying in superficial veins shown by women only when they were anatomically like melancholic men[88]" as suggested by Metraux.[89] Even if we accept that these

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[82]The basilic vein.

[83]East pediments of the Temple of Aphaia in Aegina, Ohly, D., *Die Agineten: die Marmorskulpturen des Tempels der Aphaia am Aegina. Ein Katalog der Glyptothek, München* (Munich 1976), vol. I: warrior defeated (O.III. and O.III.k, O.III.i + k): veins on the shoulder, upper arm, and elbow, on foot pls. 19-20, 22, 24. Warrior (O VIIe): wrist with veinous network, pl. 43. Fallen warrior (O.XI): veins of upper and lower limbs, pls. 64, 71.

[84]Upper limbs: cephalic and basilic veins. Lower limbs: great and small saphenous veins. Hands: dorsal arcade and venous arcade. Foot: dorsal arcade, medial marginal vein. See, pl. 300.

[85]Richer, *Artistic Anatomy*^{2}, 76.

[86]Empedokles, F91 (Wright) [Arist., *Resp.* 473 a15]. For an analysis of Empodekles' theory about blood and soul, Harris, *The Heart and Vascular System,* 15-19.

[87]Arist., *MA* 712a.1-21. Traced back to Anaxagoras by Metraux, *Sculptors and Physicians*, 54.

[88]Arist., *HA* 521a.22-31. For atrabilious persons who are thin and whose veins may stand out see, *Pr.* 30. 954a 6-8, and Metraux, *Sculptors and Physicians*, 62.

theories, only found in later texts, may be traced back to earlier sources, it is unlikely that the representation of veins can be related to such limited notions. We have seen that, according to literary sources, the early mention and definition of the physiological functions of blood vessels is usually assigned to Alkmaeon of Kroton (*floruit* ca. 490-440),[90] who is contemporary to the first known representation of veins on the human figure. In fact, although it is clear that sculptors were not aware of internal blood vessels, both physician and sculptor show a growing interest in the human body and its anatomical components, one through the attempt of a scientific explanation of some of its physiological functions, the other, by observing closely human anatomy and adding further details, such as veins, on the human figure.[91]

Other elements further confirm that sculptors looked closely at the human body. From the early fifth century, female anatomy and proportions are better observed and rendered through the garments. On some works dated to the 500s-480s,[92] shoulders are narrow and rounded, and breasts, still small, are set closer together and reflect a growing knowledge of the female body. On earlier marbles, most female figures in the round and in relief have a triangular-shaped torso and small breasts with a large space in between (**S13, S24, S26**) (pls. 6-7, 20, 23). The "male" proportions - large shoulders and narrow hips - which were the norm in Attic female statuary throughout the Archaic period may be explained by the fact that, in Athens, females are not depicted naked on the extant marbles.[93] Sculptors were, therefore, less

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[89]*Sculptors and Physicians*, 51-69.

[90] See 46-49.

[91] For the relation between medical theories and art see Conclusion 226-229.

[92]**S3, S25, S28, S68j, S69** (pls. 1, 2; 21; 27; 105; 118, 1).

[93]The only known example of a female nude figure is a small naked female from the

interested in female anatomy and proportions, since when they carved female statues, they were usually more interested in the rendering of drapery folds and clothing.[94]

The accurate rendering of anatomy was not only limited to details but reflects a greater understanding of the human body and its structure. Throughout the sixth century, boundaries of muscles were defined by continuous contours, and by small closed forms which suggest unrelated areas of anatomical patterns; emphasis was placed on surfaces which lent themselves more easily to decorative patternwork,[95] such as the superfical anatomy of the abdomen and knee-cap. At the turn of the century, however, sculptors progressively relate anatomical features in a subtle play of light and shadow, and minimize some anatomical boundaries which has been strongly emphasized earlier (volume of cheeks and chin, inferior border of the pectorals and boundary between torso and hips, volume of the knee-cap) (**S8, S31, S32, S59**) (pls. 3, 2; 33-34; 36; 88; 91). On the anterior aspect of the torso of (**S32**) (pl. 35), a median furrow extending from the pit of the neck to the navel, further increases the relation between the various parts of the torso (often divided into the pectorals, costal margin, and abdomen). This "relatively soft or fluid"[96] rendering of anatomy reflects a greater understanding of the interrelation between the various parts of the body that can be also seen in the more accurate representation of flexed and extended muscles. Earlier attempts to suggest them on a body in motion appear from the last decades of the sixth century, as soon as the development of

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Acropolis dating from the early 8th century, see Ridgway, B.S., "Images of Athena on the Acropolis" *Goddess and Polis. The Panathenaic Festival in ancient Athens* (Princeton 1992) 119.

[94]The lack of tradition in treating females is also noted in vase-painting, see 179-180.

[95]Similar trends are noticed in vase-painting, see 173-174. About the development of the knee-cap in the Archaic period, Richer, P., *Le nu dans l'art, l'art grec*, vol. 2 (Paris 1926) 63, fig. 84.

lifelike poses is noticed in sculpture, but their rendering remains inacurate. Here (**S32, S68s**) (pls. 35; 112-113), the sculptor outlines the contraction and extension of the muscles according to the body's movement: tendons are contracted on the wrist of a grasping forearm (wrestler: **S53c**) (pl. 74), and the flexed muscle of the upper arm (biceps) on the flexed arm of the attacked warrior (**S68s**) (pl. 112) is bulging.[97]

The interest in suggesting some distinctive facial features and facial expression coincided with that in a more accurate rendering of anatomy. It is, therefore, important to examine the development of "early portraits" and facial emotion in marbles in this light. All these trends reflect a common interest in representing the *phenomenon,* both - portraiture and expression - depend on the rendering of anatomical features.

While "real" portraits (representing facial features of a specific individual and hence his likeness) are usually acknowledged from the fourth century,[98] a few earlier marbles, dated from the second half of the sixth century and onwards, have occasionally be seen as attempts at individual characterisation.

The Rayet (**S64**) (pls. 93, 2-94, 1) and Sabouroff heads were mentioned among them,[99] but must be excluded. The first was described as a youthful athlete and the second as either

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[96]Hurwit, *AJA* 93 (1989) 67.

[97] Detailed study of the effect of ponderation on the musculature, 113-114.

[98] The birth of Greek portraiture has been the subject of wide scholarship: see Richter, *The Portraits of the Greeks*[3], abridged and revised by R.R.R. Smith (Oxford 1984), and for a summary of previous scholarship on the subject, see *Griechischen Porträts*, ed. K. Fittschen (Darmstadt 1988).

[99] The Webb Head (London, British Museum 2728) was considered a Roman copy of Antenor's Aristogeiton. It is not studied here because Roman copies of Greek originals were excluded since they are related to specific stylistic problems. See Dörig, J., "L'Harmodios d'Anténor et le probléme des copies romaines d'après des chefs-d'oeuvres archaïques", *AntK* 12 (1969) 41-50.

the portrait of Peisistratos,[100] or that of an Oriental.[101] The short hair-style of the Rayet Head, its fleshy ears - sometimes thought to be a disfigurement resulting from the sport of boxing,[102] and the atypical carving of facial volumes (protruding eyes and over-emphasized cheekbones), have been explained as "a new type of characterization which lies further in the emphasis of youthfulness".[103] Similarly, the roughly picked hair and moustache of the Sabouroff head, along with the shape of his face, eyes and cheekbones were thought to reflect some aspects of an individual likeness. All these features, however, do not point to any specific activity, age or individual. I have already noticed that short hair was not an exclusive attribute of athletes. The strongly protruding eyes and emphasized cheekbones of the Rayet Head do not point to his youth either since they can be also found on the bearded, and hence, mature head of Dionysos from Ikaria.[104] As noted by Viviers and Rolley about (**S64**), "le rendu original de la chevelure par un travail extérieur (trim hair-style cut in incised crescent locks), l'accentuation si caractéristique des pomettes, ... le dessin des yeux, la courbe des arcades sourcillières, tout dans ce visage procède du graphisme"[105] and "montrent un sculpteur qui s'intéresse beaucoup plus au jeu de la lumière sur les surfaces qu'à l'architecture des volumes",[106] rather than

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[100] Langlotz, E., Schuchhardt, W.H., *Archaische Plastik aus der Acropolis* (Frankfurt 1943) 17. Schefold, K., *Griechische Plastik I. Die grossen Bildhauer des archaïschen Athen* (Basel 1949) no 46, 47-73.

[101] Robertson, *HGA*, 110; Akurgal, *AKP*, 14.

[102] Ridgway, *Hesperia suppl. 20, Studies in Honnor of H.A. Thompson* (1982) 118-122.

[103] Eckstein, F., "Τὰ ὦτα Κατεηγότα", *AJA* 89 (1985) 617.

[104] Athens, National Museum 3072, related with the **S64** by Wrede, W., "Der Maskengott", *AM* (A) 53 (1928) 67)70, and recently by Viviers, *Sculpteurs*, 203, and fig. 54.

[105] Viviers, *Sculpteurs*, 204.

[106] Rolley, Cl., "Une nouvelle tête de kouros archaïque au Musée du Louvre", *RA* (1970) 22.

portraying facial features of a specific individual. Although the Sabouroff Head is not thoroughly considered here because of its uncertain provenance,[107] like the Rayet head, it cannot be seen as an attempt at individual characterisation. Its appearance is not due to the representation of features reflecting individual likeness, but rather to the manner of cutting the transitions between cheeks and jaws,[108] and to the technique used to carve hair and moustache (in a roughly picked surface) which becomes common only at the end of the century.[109] Therefore, one cannot speak of portraiture for both examples, but of a distinctive manner of carving the marble which seems relevant to the style of either the sculptor,[110] or a regional school.[111]

Yet, at about the same period, literary sources mention the statue of Hipponax by Boupalos and Athenis (**T3**), and that by Theodoros of himself (**T1**). It was noticed that literary references to early attempts at portaiture do not provide firm evidence of the likenness of these statues to their model and that ancient authors, speaking about portraits, probably meant a slight deviation from the facial features typical to contemporary statues.[112] This seems to be confirmed by the only surviving marble, dating from that time, which portrays a

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[107] Provenance: Aeginetan or Athens, Blümel, *Katalog*, vol. 1, 6. Also discussions on the date: *ca.* 550-525, Karouzos, *Aristodikos*, 50. Boardman, *GSAP*, 74. Walter-Karydi, *Alt-Ägina*, II, 2, 70. 510-500, Blümel, C., "Stuckfrisuren auf Köpfen griechischen Skulpturen des Sechsten und Fünften Jahrhunderts vor Chr.", *RA* (1965) 23.

[108] Aeginetan style for Walter-Karydi, *Alt-Ägina*, II, 2, no 20, 70, 75-76.

[109] See above, 77-80.

[110] The Rayed Head (**S64**) (pl. 94, 1) has been often related with the ball-players' base (**S53**) (pl. 65), and the potter's relief (**S34**) (pl. 39, 2), all of them attributed to Endoios or his workshop, see Deyhle, *AM* 84 (1969) 18. Schmidt, G., "Kopf Rayet und Torso vom Piräischen Tor", *AM* 84 (1969) 65-75. Boardman, *GSAP*, 83.

[111] Ionian for the Rayet Head, Rolley, *RA* (1970) 22, and Aeginetan for the Sabouroff Head, Walter-Karydi, *Alt-Ägina*, II, 2, no 20, 70, 75-76.

boxer, identified by his banded fist and broken nose,[113] but whose facial features do not mirror an individualized appearance. The study of anatomical rendering shows clearly that, before the last decades of the sixth century, sculptors did not observe closely their model, and were not, therefore, acquainted with the anatomical knowledge necessary to suggest the appearance of an individual.

If we now turn to the following years, during which sculptors develop their anatomical knowledge, and would be, therefore, able to suggest an individual likeness, no "real portraits" have survived. The pediments from Olympia and a few Roman copies of Greek originals, dated to the second quarter of the fifth century, show only slight deviations from the common facial type in the rendering of mouth, eyes, and hair-style.[114] Although there is no doubt that the sculptors of these period were concerned with a more accurate rendering of human anatomy and looked at the human body, their interest in naturalism is limited. They occasionally portray faces with some individualized features but which remain idealized, and which follow Aristotle's definiton of the portrait. We have seen that the philosopher, who praised Polygnotos of Thasos, a contemporary painter to these marbles, recommended an art which shows men better than they are. These representations, however, differ from earlier

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[112] See discussion, 27-29.

[113] Not included in the catalogue because of its early date (550-530), Athens, Kerameikos Museum, Richter, *AGA*, no 31, 23-24, fig. 92.

[114] Some heads from the Olympia pediments, east pediment: old man (N), head of Kladeos, see *Die Olympia-Skulpturen*, ed. Hermann, H.V. (Darmstadt 1987) pls. 26, 33. Copies of Harmodios and Aristogeiton by Kritios and Nessiotes: Brunnsåker, S., *The Tyrant-slayers of Kritios and Nessiotes* (Stockholm 1971) 47 (list of replicas), and pls. 7-8 (head of Aristogeiton, Rome, Museo del Palazzo dei Conservatori). Head of a strategos (Miltiades?), Roman copy of an early fifth century original: Rome, Museo Barracco 79, Richter, *Greek Portraits*, vol. 1, fig. XVII.

marbles even if they are not real portraits.[115] They combine an accurate - which was not developed in the Archaic period - and idealized rendering of human anatomy. The passage of Aeschylus, also contemporary to these marbles, in which satyrs are marvelling at the extraordinary lifelike appearance of carved representations of themselves, does not point to the existence of portraits but probably reflects the reaction of Athenians to this new style.

The interest in portraying facial expression is often considered as a new development dated to the second quarter of the fifth century, the usual examples cited being figures from the east pediment of the Temple of Aphaia (*ca.* 480),[116] and the Olympia pediments (*ca.* 470-450).[117] In fact, expressive faces, although without the nuances of feelings of the Olympia pediments, already occur on marbles of the last quarter of the sixth century and throughout the first quarter of the fifth. Among Attic marbles, two examples have been preserved: one fragmentary from the Acropolis (**S6**) (pl. 2, 2), and the face of a robber from the Athenian Treasury metopes (**S68i**) (pl. 104). Both are bearded and belong to defeated fighting figures. Pain on both is suggested by a wrinkled forehead, and on the Athenian Treasury head, by an open mouth. Outside Attica, similar conventions are used in featuring emotion (deeply wrinkled foreheads, sometimes wrinkled cheeks, and open mouths with bared teeth),[118] and

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[115] See about the conditions whi may favoured the development of real portraits, Schweitzer, B., *Studien zur Entstehung des Porträts bei den Griechen* (Leipzig 1940) 8.

[116] Two dying warriors: O.VI a + b, O.XI, Ohly, D., *Die Ägineten,* pls. 36-37, 69-70. Robertson, *HGA*, 167. Pollitt, J.J., *Art and Experience in Classical Greece* (Cambridge 1972) 19-20.

[117] Harrison, E.B, "Early Classical Sculpture", *Archaic*, 42: "emphatic forms to express character and action, for which the best example is the Olympia pediment". Rolley, *Sculpture*, 375-376: "recherche de l'expression la plus directe, alliée à l'observation non idéalisée de la réalité". For illustrations, *Die Olympia Skulpturen*, pls. 11, 17b-19.

[118] Already noticed by Girard, P., "De l'expression des masques dans les drames d'Eschyle", *REG* 7 (1894) 366-367.

expressive faces belong to the same type of figures, defeated or dying bearded warriors,[119] often seen in frontal view.

The grimaces showing lust, pain or terror on these faces have been compared to those of a group of terracotta masks dedicated to the sanctuary of Artemis Orthcia in Sparta, the majority of which are dated, on archaeological grounds, to the first half of the sixth century.[120] Votive masks like those from Ortheia were probably worn during religious ceremonies (such as dances in honour of a divinity)[121] and in ancient forms of comic entertainment,[122] and are often considered the forerunners of the early form of theatrical mask (for which we do not have any material evidence).[123] Several scholars have paralleled the development of facial emotion in sculpture with that of the Attic tragedy and explained the grotesque aspect of expressive

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[119] *E.g.* dead warrior (Gigantomachy): Siphnian Treasury, North frieze, Delphi, Archaeological Museum 1523, La Coste-Messelière, P. de, *Art archaïque (suite): les trésors "ioniques"*, *F.D.* IV, 2, (Paris 1928) hors-texte, pl. 17. Injured giant: Selinus, temple F, metope, Palermo, Museo Nazionale 3909B, Tursa, V., *La scultura in pietra de Selinunte* (Palermo 1983) pls. 9-10.

[120] Dickins, G., *The Sanctuary of Artemis Orthia at Sparta* (London 1929) 165-175, pls. 47-49. Carter, J.B., "The masks of Ortheia", *AJA* 91 (1987) 358-359.

[121] See for instance, Poll., *Onomastikon* IV,104: καὶ Βάρυλλικα, τὸ μὲν εὕρυμα Βαρυλλίχου, προσωρχοῦντο δὲ γυναῖκες Ἀρτέμιδι καὶ Ἀπόλλωνι (women used to dance the *Barullika*, the invention of Barullikos, in honor of Artemis and Apollo, transl. by Webster).

[122] See Ath. (651d) quoting Sosibios.

[123] Two masks from Megara Hyblaea dated to the end of the sixth century are known but the one is probably votive (Frontisi-Ducroux, F., *Du masque au visage: aspects de l'identité en Gréce anciene* (Paris 1995) 6) and the other is a mould in poros: Syracuse, Museo Archeologico Regionale (inv. numbers not known), Kachler, K.G., *Zur Entstehung und Entwicklung der griechischen Theatermaske* (Basel 1991) figs. 26-27. For a summary of the different theses on the origins of Greek drama and for further bibliography, Martin, A., "La tragédie attique de Thespis à Eschyle", *Culture et Cité. L'avènement d'Athènes à l'époque archaïque (Coll. int. ULB, 27-29 Avril 1991)* eds. Verbanck, A., Viviers, D. (Brussels 1995) 17-19. For the relation between these early masks and theatrical masks, Webster,T.B.L, *Greek Theater Production* (London 1956) 128-131.

marble faces through the influence of theatrical masks,[124] the appearance of which must have been quite close to the "frowning" cult masks from the sanctuary of Artemis.[125]

There is, indeed, common grounds between contemporary sculpture and early drama in the way both suggest emotion by conventional means: masks on stage represent a fixed expression and conceal any further nuances in temperament and mood described in the texts of the plays,[126] and the grimacing faces in sculpture are also an over simplified rendering of the wide range of feelings seen in nature. Yet, it is difficult to demonstrate a direct influence from one on the other. In these early attempts at representing emotion, sculptors naturally choose striking expressive features such as frowning forehead, contracted muscles of the cheeks, closed eyes and open mouth) which were already displayed in art by monstruous figures like Gorgo or satyrs. In fact, these early known examples of expressive faces belong to a period in which the anatomical knowledge of the sculptors increased dramatically but was not yet completely mastered. The contemporary rendering of expression reflects this lack of knowledge. Sculptors indicate emotion without understanding how the facial muscles interrelate and move to suggest nuances in expression. They, therefore, simplify the range of human feelings to some expressive models, and late Archaic sculpture suggests the *phenomenon* only through its more typical aspect, the caricature.

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[124] We are told that Aeschylus was the first to use painted and terrifying masks: Suda, *s.v.* Aeschylus, "οὗτος πρῶτος εὗρε προσωπεῖα δεινὰ χρώμασι κεχρισμένα ἔχειν τοὺς τραγικοὺς ... About the development of Attic tragedy and list of known plays, see Martin, *Culture et Cité*, 15-26.

[125] Kenner, *Das Theater und der Realismus*, 12-16. Charbonneaux, J., "Les masques rituels ou scéniques dans la sculpture grecque", *Mélanges Glotz*, vol. 1 (Paris 1932) 203-213. Pollitt, *Art and Experience*, 27.

[126] See Pickard-Cambridge, A., *The Dramatic Festival of Athens*[2] (Oxford 1988) 171. And more recently by Frontisi-Ducroux, *Du masque au visage*, 45.

Lack of anatomical knowledge combined with the difficulty of carving the transition between cheekbones and cheeks, and between the corner of the mouth and jaw, may also explain another expressive feature: the "Archaic smile". Several differing interpretations have been made of it by earlier scholars. It has been understood as an expression of contentment and beauty and as a symbol of the aristocratic status of the dedicators, close to the gods themselves (ἰσόθεοι),[127] ageless and happy.[128] Martini, who notes that a smiling expression is common in sculpture in the round and rare in relief, explains that, as the inscription on the base, the smile is a mean of increasing the exchange and communication between the statue, usually seen in a frontal view (while faces in relief are often seen in profile), and the viewer.[129] It is difficult to accept the Archaic smile as a self-conscious sign of joy or well-being or even beauty, since not only dying warriors, but also sphinxes, the very symbol of death, described as dogs of Hades, show it.[130] The smiling expression does not appear only on frontal faces, as suggested by Martini, but also on faces in a three-quarter view in architectural marbles either in the round or in very high relief such as those from the Athenian Treasury metopes (**S68k, m, u**) (pls. 108; 116) and occasionally in a few low reliefs where the figure is shown in profile (**S11, S53**) (pls. 4, 2; 59). Although it is also difficult to see it as "the expression of a magic

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[127] Webster, T.B.L, "Greek theories of art and literature down to 400 B.C.", *ClQu* 33 (1939) 170. Ducat, J., "Fonctions de la statue dans la Gréce archaïque: kouros et kolossos", *BCH* 100 (1976) 242.

[128] Schneider, L.A., *Zur sozialen Bedeutung der archaischen Korenstatuen* (Hamburg 1975) 27-29. For ancient literary sources and the meaning of smile, see also Fowler, B.H., "The centaur's smile: Pindar and the Archaic aesthetic", *Ancient Greek Art and Iconography*, ed. Moon, W.G. (Madison Wisc. 1983) 159-170.

[129] *Die archaische Plastik*, 84.

[130] *Ibid.*, 83.

life-force",[131] it seems probable that, in the early stage of Archaic sculpture, the smile was due to the difficulty of carving the transition from mouth to cheek, and that it was, then, retained in order to "make the face look more alive".[132] This thesis is supported by the nature of low reliefs in which the Archaic smile sometimes appears: they display very strong boundaries between anatomical features and do not use all the subtleties of modelling offered by stone carving. Archaic smile must be, therefore, associated with a lack of anatomical knowledge and nuances in the carving technique.

Epigraphic and literary evidence connects closely sculpture and painting. It attests that sculptors were also painters,[133] and that painters or vase-painters and sculptors may belong to the same family.[134] In a few marbles, it is difficult to know whether the sculptor himself or another artist painted the base of the statue;[135] applied the colours to enhance carved details (such as hair, facial features, nails); and painted rather than carved some features- such as the mantle of a rider from the Kerameikos,[136] of a female figure on (**S60**) (pl. 93, 1), and the pubic hair on (**S37, S57**) (pls. 4, 2 (1); 84).[137] Given this close relation between painting and

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[131] Kenner, H., *Weinen und Lachen in der griechischen Kunst* (Vienna 1960), 66.

[132] Boardman, *GSAP*, 66.

[133]Polygnotos: Plin., *HN* 35, 58 (painter), 34, 85 (sculptor). Euphranor: Plin., *HN* 35, 128 (sculptor), Paus. 1.3.4. (painter).

[134]According to the reading of some dedications from the Akropolis, the painter Eumares was the father of the sculptor Antenor, and Pollias, the sculptor and bronze maker, the father of Euthymides: Raubitscheck., *DAA*, nos 197 & 150, 522. See also Viviers, "Les ateliers de sculpteurs en Attique", *Culture et Cité*, 213.

[135]The base of Nelonides: Athens, Epigraphical Museum 12870, Viviers, *Sculpteurs*, no 1, 67-77, figs. 3-4.

[136]Kübler, K., "Ausgrabungen im Kerameikos" *AA* (1933) figs. 18-19.

[137]Painted rather than carved anatomical details were sometimes considered to be a workshop's hallmark in sculpture, see about **S37** and **S57**, Viviers, *Sculpteurs*, 188. For

sculpture, it is important to examine to what extent colours enhance naturalism in statuary, and how sculptors, interested in a more accurate representation of the human body, used them, even though polychromy is not extensively preserved.

According to the extant material, colours were limited to black, dark blue, yellow, ocasionally green, and red, which is the best preserved.[138] Anatomical and clothing details - hair, brows, eyes, sometimes eyelids, lips, pubes, and nails- were coloured on sculptures in the round and in relief, and, according to descriptions made at the moment of the discovery of some statues,[139] the unclothed parts were occasionally tinted. Because of its highly absorbent nature, limestone sculpture still furnishes visible evidence that male flesh was painted in red-brown, and female covered with white stucco **(S66a, S67)**.[140] Traces of painting were also found on the bare parts of some figures in marble which seem to have been occasionally covered with reddish brown on males, and light red, or left white on females.

It is unlikely that Archaic polychromy was meant to increase naturalism in statuary. The restricted number of colours could not suggest the nuances of natural tints, and their use

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different categories of painted details, see Ridgway, B.S., "Painterly and pictorial in Greek relief sculpture" *Ancient Greek Art and Iconography*, 193-194.

[138]For the components of these colours, see Manzelli, V., *La Policromia nella Statuaria Greca Arcaica*, (Rome 1994) 131-148.

[139]For examples see, Demetriou, P., *The Polychromy of Greek Sculpture to the Beginning of the Hellenistic Period* (New York 1947), 226-267; and Reuterswäld, P., *Studien zur Polychromie der Plastik, Griechenland und Rom. Untersuchungen über die Farbwirkung der Marmor und Bronzeskulpturen* (Stockholm 1960) , 68.

[140]It has been sometimes suggested that colours used on the nude parts of limestone figures were brighter than those on marble since traces on the former seem more vivid (Spivey, N., *Understanding Greek Sculpture. Ancient Meanings, Modern Readings* (London 1996) 77). Yet this difference may be due to the material since limestone preserves colours better than marble (Ridgway, B.S., "Stone carving: the sculpture" *The Muses at Work* (Cambridge Mass. 1969) 106.

seems to follow conventions rather than nature. For hair, dark tints are mainly found on bearded and hence mature males, among which are gods (**S6**) (pl. 2, 2)[141], heroes or simple mortals (**S15**); light colours (including yellow)[142] seem to be usually associated with female and young figures;[143] red occurs on a significant number of female (**S2, S18a, S28, S32**) and beardless male heads (**S29, S34, S57, S59, S66f**), although it is unclear whether this colour, which is the most common, was meant to be seen, or used as an undercoat probably for gilding.[144] The association of a whiter complexion with women and darker with men reflects the fact that women stayed indoors more than men, but it is also a conventional way of distinguishing the sexes which was not shown by bodily proportions, and is a practice common to contemporary sculpture in stone, terracotta, and to black-figure vase-painting. In fact, polychromy makes some anatomical and clothing details stand out, and enhances the beauty of the statue but does not contribute to its naturalism. This is further confirmed by Lucian, who, although speaking of later artists and sculptures, when describing an ideally

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[141]Outside the catalogue, Triton from a pediment in poros: Athens, Acropolis Museum 35 & 36; Zeus enthroned: Athens, Acropolis Museum 9; charioteer; Athens, Acropolis Museum 10 + 3, see reconstruction, Manzelli, *La Policromia nella Statuaria*, pl. 8.

[142]Traces on **S28, S29**, and other korai, not included in the catalogue: Athens, Acropolis Museum 615, Richter, *Korai. Archaic Greek Maidens. A Study of the Development of the Kore Type in Greek Sculpture* (London 1968) no 125, 81, figs. 401-404. Athens, Acropolis Museum, 639, 664, Brouskari,M., *The Akropolis Museum. A descriptive Catalogue* (Athens 1974) 114, fig. 214; 100, fig. 193.

[143]For red as an attribute of feminine character but also of life and youth, Manzelli, *La Policromia nella Statuaria*, 82, 84. Red on the head of some bearded figures has been considered as an undercoat for a dark colour (**S1**, red hair combined with blue beard: **S34**): Reuterswärd, *Studien zur Polychromie*, 66. Use of gold on hair: Reuterswärd, *Ibid.*, 160-165.

[144]Stewart, *Sculpture*, 41. For evidence of gilding on a late-fifth century stele, Schlörb-Vierneisel, B., "Zwei klassische Kindergräbe im Kerameikos", *AM* 79 (1964) 93-95.

beautiful statue, attributes to it various features from famous sculptors, and assigns its painting to illustrious painters "who enhance the perfection of form".[145]

From the last decades of the sixth century, a polished finish may be seen on the nude parts of some figures in marble,[146] which has been identified with the γάνωσις referred to by ancient texts.[147] It is now usually acknowledged that this mixture of oil and wax was applied on marbles in order to protect and give them a superficial gloss but did not tint the bare body of the statue.[148] Often attested for late Hellenistic and Roman sculpture, it seems to have been introduced on some late Archaic and early Classical works, although with a less shiny effect **(S28, S29, S31, S32)**.[149] Associated with figures which have their anatomical features related in a subtle play of light and shadow, it is used by the sculptor not only in order to imitate the

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[145]Εἰκῶνες 7: ...Οὐ τὸ μικρότατον ὦ φιλότης εἰ μή σοι δόξει ὀλίγα πρὸς εὐμορφίαν συντελεῖν χρόα καὶ τὸ ἑκάστω πρέπον, ὡς μέλανα μὲν εἶαι ἀκριβῶς ὁπόσα μέλανα, λευκὰ δὲ ο τοιαῦτα χρή, καὶ τὸ ἐρύθημα ἐπανθεῖν καὶ τὰ τοιαῦτα ... (ἐρύθημα is sometimes translated by the flesh of life but it literally means the flush on the cheeks, see Liddell-Scott)

[146]Reuterswärd, *Studien zur Polychromie*, 67.

[147]Main mention in Vitruvius, *De Architectura* VII. 9. 2-4. For a recent analysis and other literary souces, Manzelli, *La Policromia nella Statuaria*, 102-115.

[148]The protecting function of the γάνωσις is described by Pliny, *N.H.*, 33.122, while its non-colouring effect on marble was first suggested by Richter, "Were the nude parts in Greek marble sculpture painted ?", *MMA Studies* 1 (1928-1929) 27, and latter by Manzelli, *La policromia nella Statuaria*, 115.

[149]Palagia O., "Les techniques de la sculpture grecque sur marbre" *Marbres Helléniques, de la sculpture au chef-d'oeuvre* (Exhibition Catalogue) (Brussels 1987) 87. Polish is also preserved on some areas of the figures of the Parthenon pediments, Haynes, D.E.L., "A question of polish", *Wandlungen. Studien zur antiken und neuren Kunst. E. Homann-Wedeking. Gewidmet* (Bayern 1975) 131.

gleam and light-diffusing power of bronze, [150] but also to enhance the interrelation between the various parts of the body of these statues.

Although a growing anatomical knowledge is shown by most sculptors, a distinctive rendering of anatomical features, which may be either naturalistic or decorative, may be also influenced by other elements. The technique (the carving process and the influence of bronze); setting (how the statue is intended to be seen); size; and the personal or regional style all may have a part to play.

In low reliefs, [151] the representation of some anatomical features may sometimes differ slightly from that seen in sculpture in the round and high reliefs. Some muscles of the back,[152] the upper arm (biceps),[153] forearm (brachioradialis),[154] and thigh (lateral border of the vasti)[155] are suggested in low reliefs in patterns close to those seen in painted stelai and vase-painting;[156] and anatomical details, such as the tendons,[157] and folds of skin[158] occur both in

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[150]Hurwit, *AJA* 93 (1989) 67, note 97.

[151]The so-called low relief does not exceed 6 cm. in depth, See Casson, S., *Technique of early Greek Sculpture* (Oxford 1933) 136.

[152] The shoulder-blades, the large muscle of the back (latissimus dorsi), and the volume of the buttocks (**S38a, S53a**) (pls. 44; 64).

[153]Indicated in a concave line on reliefs (**S42, S38a, S53a-c**) (pls. 44, 1; 47; 63).

[154]An arc carving above towards the contour of the forearm (**S42, S53**) (pls. 47; 64).

[155]The lateral border of the muscle on the leg in profile is carved parallel to the contour of the thigh and sweep above or below the knee: (**S36a, S42, S49, S53 a-c, S58**) (pls. 46; 48; 55; 67).

[156]Painted stelai: Athens, National Museum 30, Richter, *AGA*, no 70, 48, figs. 159-160; Athens, Kerameikos Museum P 1133, Schmalz, B., *Griechische Grabreliefs* (Darmstadt 1983) 82-83, fig. 5. Vase-painting: for muscles of the back, *e.g.* **V130**, pl. 263, 1; of the upper limbs, *e.g.* **V86,** pl. 215; **V152**, pl. 276, of lower limbs, **V2**, pl. 171.

low reliefs and contemporary red-figure vase-painting, while they are rare in free-standing and high relief. The similarity between low reliefs and painting or vase-painting may be partly explained by the technique used for carving. In reliefs, drawing is the starting point,[159] and figures, cut with a clear outline, are then filled in with anatomical details,[160] a process used by red-figure vase-painters and probably also by contemporary painters.[161] The close parallel between low relief, contemporary painting and vase-painting is, therefore, due to the importance of outline in all these techniques. In low relief as in painting, the figure remains "virtually just raised silhouette, as contrasted with metopal sculpture which also originates from drawing, but technically, with its deep undercutting, more resembles sculpture in the round."[162] The relation between relief and painting is further illustrated by the resemblance in style between painted and carved stele such as those of Aristion (**42**) (pl. 46) and Lyseas,[163] which were occasionally attributed to the same artist.[164]

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[157]On the wrist in pronation (**S42, 53c, S65**) (pls. 47; 74, 1-2) and at the bent of the knee (hamstrings: **S42, S53, S58**) (pl. 48).

[158] They are incised and mark the armpit (**S51**) (pl. 58), the bent of the elbow (**S51, S53c**), the wrist in pronation (**S51**) (pl. 57), and the joints of the fingers (**S34, S46, S58, S60**) and toes (**S42**) (pls. 40, 1; 49; 93).

[159]After preparation of the stele the sculptor makes a rough drawing of the figure and probably incised some light guidelines in the stone before starting the actual carving, Adam, S., *The Technique of Greek Scupture in the Archaic and Classical Periods* (London 1966) 108.

[160]For the emphasis on the contour of the figure, see Casson, *Technique*, 145.

[161]About the importance of outline in Archaic painting as mentioned by ancient texts, see 216-217.

[162]Ridgway, *SS*, 45.

[163] Athens, National Museum 30.

[164]Viviers (*Sculpteurs*, 175-180) also assigns the stele of Lyseas to the sculptor Aristion who carved that of Aristokles.

It is likely that the thick and fleshy upper and lower eyelids of marbles from the 480s (**S28, S29**) (pls. 28; 29; 30, 1) influence of large scale bronze statuary. Metraux thinks that these features result from the sculptor's desire to represent the two properties of the human eye: the ability to lift the inferior eyelid, and the presence of eyelashes on the lower lids.[165] Yet, these properties were described and attributed to the human being only by Aristotle and there is no evidence that they were mentioned by earlier philosophers such as Anaxagoras.[166] It seems probable that thick borders in marble eyelids were carved in order to add painted eyelashes, as they were on the Blond Boy at the moment of its discovery,[167] and to imitate the appearance of bronze statuary in which metal eyelashes were inserted in both upper and lower eyelids.[168] This practice became common in bronzes from the early fifth century along with the common use of inlaid eyes;[169] whereas, on earlier bronzes, eyes were cast solid with the rest of the face, and eyelashes were not added.[170] In bronze statuary, eyelashes were made by

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[165] *Sculptors and Physicians*, 89-90.

[166] Lower eyelashes: Arist., *HA* 498b, 20; squinting: Arist., *Pr.*, 896b, 5-6.

[167] **S29**, described by Dickins, *Catalogue*, vol. 1, 248-249.

[168] They may be also seen on some contemporary terracotta statues, Zeus, Olympia, Archeological Museum, see Moustaka, A., *Grossplastik aus Ton in Olympia*, *OlF* 22 (1993), pls. 9-12, while metal eyelashes were also inserted in a few marble faces: Athens, Akr. 681, and eyes framed with bronze inlays see Metaponto, Museo Archeologico Nazionale 135652 (*ca.* 470-460), *Greci in Occidenti (Exhibition Catalogue)*, ed. Carratelli, G. (Venice 1996) 395, 697, no. 149. See also, Mattusch, *CB*, 24, and note 6.

[169] *E.g.* Poseidon from Livadhostroto: Athens, National Museum 11761, see catalogue pl. 299, Walter-Karydi, *Alt-Ägina*, II, 2, fig. 143. Delphian Charioteer: Delphi, Archaeological Museum 3484, 3540, Chamoux, F., *L'aurige de Delphes*, *F.D.* IV,5, pls. 16-17. Artemision Poseidon: Athens, National Museum 15161; Stewart, *Sculpture*, figs. 287-288.

[170] Two late sixth century examples are known. A mould for a kouros' head from the Athenian Agora, Mattusch, C.C., "Bronze and ironworking in the Athenian Agora", *Hesperia* 46 (1977) 345, note 12; and a kouros found from a wreck in Piraeus, Archaeological Museum, Mattusch, C.C., *Greek Bronze Statuary from the Beginning through the Fifth Century B.C.*

two new techniques which cut or added them on the borders of the eyelids,[171] and were, hence, thicker than formerly. In both marbles and bronzes, the addition of eyelashes was to enhance the beauty of the statue since they were considered attributes of a godlike appearance by contemporary and earlier literary sources,[172] rather than at reflecting an anatomical and philosophical observation.

The posterior aspect of the torso of some statues in repose (**S8, S55, S52, S57**) (pls. 77, 83) is left flat and its anatomy suggested only in a decorative manner because these marbles are "still strictly bound by Archaic frontality",[173] and their back not usually intended to be seen. As soon as posterior views of the torso increase in architectural sculpture, and poses are developed in free-standing sculpture which gradually suggest a three-dimensional space in which the statue is set (by the turn of the head, rotation of the body, and ponderation) (**S31, S32, S36**) (pls. 34; 35; 41),[174] the back is modelled in the round, the curve of the superior part of the spine suggested, shoulder-blades outlined, and on some marbles (**S32**) (pl. 37), the larger muscle of the back (latissimus dorsi) and two small depressions on both sides of the spine (the fossets of the loins) are added (**S68r**) (pl. 111).

(Ithaca 1988) 74-79. For the discussion of the date of the Piraeus bronze date see 129, note 39.

[171] For explanation of the techniques, see 122-123. *E.g.* (**B3, 20**) (pls. 123; 137), and Delphian Charioteer, *F.D.* IV,5, pls. 16-17.

[172] See above, p. 45.

[173] Roberston, *HGA*, 162.

[174] The stance of **S32** which invites the viewer to turn around the statue is further emphasized by a 'rotating camera' experiment in Alscher, L., *Griechische Plastik* II, 1 (Berlin 1961), 169, pl. 1b.

On some other marbles, the upper part of the eyeball is slightly bevelled and edged to suggest the upper eyelid, not carved separately. This rough indication of the eye is rare in free-standing sculpture (it is seen on two small fragmentary male heads,[175] and two korai[176]) and seems more common in reliefs (**S11, S33, S38, S54a**) (pls. 4, 2; 44; 75;). The small scale of these sculptures may explain this simplified rendering of eyelids which must have been completed in paint.

A series of statues, dating from the 520s to the 480s, has a distinctive eye-form that does not reflect a natural shape: the eye-ball protrudes significantly over the eyelids, and seems to look downwards.[177] This shape has been explained as a feature developed on marbles raised high above the ground (set on the top of a column) and meant to be seen from below,[178] or as a feature which emphasizes "the extreme mannerism" of some korai from the Acropolis.[179] It is impossible to confirm the former hypothesis because the original setting of these figures is not known, most of them being either fragmentary, or with their base missing. The protruding eyes looking downwards rather reflect a common influence which is not a workshop's hallmark since they do not display a similar rendering of other anatomical features

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[175]Athens, Acropolis Museum 642, and Athens, Acropolis Museum 623, Charbonneaux J., Martin, R., Villard, F., *Archaic Greek Art. 620-480 B.C.* (London 1971) 252, figs. 291, fig. 294.

[176] Athens, Acropolis Museum 636, and Athens, Acropolis Museum 648, Brouskari, *The Akropolis Museum*, 99, fig. 189, and 99, fig. 188.

[177] Korai: **S19, S22, S23, S24** (pl. 16, 1; 18, 1; 19), and Athens, Acropolis Museum 696, Richter, *Korai*, nos 128, and males: **S15**, Athens, National Museum 20, Richter, *Kouroi*[3], no 155, 134, figs. 450-451.

[178] Ridgway, *Archaic Style*, 146.

[179] Rolley, *Sculpture*, 184.

and garments.[180] It is probably due to an Ionian influence. Eyes carved in a similar manner appear earlier on several statues from this area,[181] and Ionian trends are acknowldged in Athens during this period (*e.g.* the Ionian kore is adopted in Athens, and must have contributed to the new patterned treatment of dress folds; in architecture, the Ionic order becomes a commoner feature, in the cemeteries the Ionian stele type with anthemion crown is adopted).[182]

The distinctive carving of hair strands as stiff shoulder locks which fall in a zig-zag step pattern, and of the upper border of the eyelids in a smooth depression rather than the usual incision occur both in **S26** (pl. 25) and in the Delphic marble pediment (**S66g**, pl. 97; locks: **S66d**, pl. 95), which are attributed to the same sculptor, Antenor.[183] These features are rare and can be paralleled only with those seen in another statue from the Acropolis (**S21**) (pl. 17, 1), which, accordingly, has been also sometimes considered to be either his work or that of his workshop.[184] The primitive appearance of the hair-patterning, considered to imitate

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[180] Two groups were proposed according to the style: one including **S19**, **S22**, Athens, National Museum 20, and another **S24**, Athens, Acropolis Museum 670, Athens Acropolis Museum 17. See Croissant, *Protomés*, 204-219, Viviers, *Sculpteurs*, 204-205; Boardman, *GSAP*, 85.

[181] See protruding almond-shaped eyes in Tüchelt, K., *Die archaischen Skulpturen aus Didyma. Beiträge zur frühgriechschen Plastik in Kleinasien* (Berlin 1970), pl. 38, K40; and protruding eyes considered to be a stylistic feature of the sculpture of Ephesos, Croissant, *Protomés*, 218-219.

[182] See Boardman, "Culture and the city", *Culture et Cité*, 12; and about a possible eastern influence in the development of the red-figure technique in vase-painting, *Ibid.*, 11.

[183]There is a very long scholarship on the works attributed to Antenor, see *e.g.* de La Coste-Messeliére, *JSav* (1942) 55; Deyhle, *AM* 84 (1969) 39-46; Arias, P., "La storiografia della scultura greca del VI sec. a.C.", *La scultura arcaico in marmo dell'Acropoli*, it. transl. of Payne, *AMS* (Rome 1981) 66-69.

[184]The similarities between **S21** and **S26** were usually noted, but only a few scholars attributed the former to Antenor, see Deyhle, *AM* 84 (1969) 40.

strands from wooden sculpture,[185] the flat and decorative anatomy of the ears, and a narrow costal margin combined with a lack of internal modelling on the flanks and abdomen of the male torsos from Delphi (**S66f**) (pl. 96), [186] has made some scholars date the whole group to the years 540-520.[187] Although **S21** and **S26** may be slightly earlier than the Delphic pediment,[188] a date close to the third quarter of the century must be excluded. We have seen that literary evidence date the pediments from Delphi to the late sixth century, a date which is confirmed for all these marbles (including those from the Acropolis) by anatomical and technical criteria. The actual flattened anatomy of the male torsos from Delphi may be explained not only by the surface erosion, but also, as regards the flanks, by the fact that they were not meant to be seen: in a fragmentary kouros in three-quarter view from the same pediment, the near flank, intended to be seen, displays a series of ridges for the subcutaneous border of the ribs.[189] Additionally, the deep and large holes drilled out in the folds of the female cloths from the Delphic pediment and the Acropolis are unknown in marbles before the last decades of the sixth century.[190] If the attribution to Antenor is accepted,[191] some of the

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[185] de La Coste-Messeliére, "Les corés de l'Acropole", *JSav* (1942) 60-61; Ridgway, "Birds, 'Meniskoi' and head attributes in Archaic Greece", *AJA* 94 (1990) 604.

[186]Richter, *Kouroi*[3], 96: in the Melos Group, *e.g.* Thebes, Archaeological Museum 3, no 94, 99-100, fig. 302. Delos, Archaeological Museum A4051, no 110, 105, figs. 341, 344.

[187] Payne, *AMS*, 63: casts doubts about the date of the pediments and their attribution to the same sculptor as **S26**. Childs, *JdI* 108 (1993) 399-441: accepts the attribution of both pediments and statue to the same sculptor but dates the Delphic pediment to the 530s.

[188] Because of the rendering of the ear, which is flat and more decorative than that of the Nike (**S66g**) .

[189]Too fragmentary for inclusion in the catalogue: Delphi, Archaeological Museum 4822, Richter, *Kouroi*[3], 140, no 166, fig. 502.

[190] Casson, Technique, 122-125, parallel on **S13** (pls. 6-7).

uncommon features of these marbles may be also partly explained by the sculptor's experience of bronze casting:[192] the contrast between the hair carving and the smooth rendering of the facial features and the sharp edges of the drapery recall metal rather than stone working, and the inlaid eyes of (**S57**) are common in bronzes while they are difficult to achieve in marbles because of the necessary insertion of the eyeball from the outside.

It was noticed that, in the late decades of the sixth century, short crimped hair was occasionally suggested by a roughly picked surface. The combination of this carving technique with a common rendering of other anatomical features may help to group some marbles together and assign them to the same workshop. The head **S72**[193] (pl. 118, 2) may be compared with that of the child **S60** (pl. 93, 1). Both display a rough surface of hair and a short coiffure that swells slightly over the nape of the neck; they display a similar rendering of the ear (the antitragus is lightly indicated, while the tragus is marked as an extension from the lobe),[194] and the eyes - significantly protruding and carved without eyelids -, and a sharp cutting of the fleshy areas to outline some facial features -the depression of the cheeks and the corner of the mouth. "The mother and child stele" (**S60**) was already connected with the ball-players base (**S38**) (pl. 44),[195] the hair of the figures on it is also carved in a smooth mass, witout many details of strands and locks, and suggests a similar preference for an "economy of

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[191] The connection between the base which bears his signatures and the kore **S26** has sometimes been questioned, see Payne, *AMS*, 63.

[192] Attested by ancient sources which attribute the early bronze group of the Tyrannicides to him (**T4**). For the atypical style of Antenor see de La Coste-Messelière, *JSav* (1942) 60-65; and Langlotz, *AMA*, 27.

[193] For this marble, Langlotz proposed some vague parallels with the Massaliot Treasury, in Olympia, *Studien zur Nordostgriechischen Kunst* (Mainz 1975) 130-131.

[194] See description by Richter of the Anavyssos stele, *AGA*, no 59, 42-43.

[195] Deyhle, *AM* 84 (1969) 28, pl. 3, 1-2.

carving" to that of the roughly picked heads. The recent association of the Fauvel Head (**S72**) (pl. 118, 2) with the body of a seated scribe (**S17**)[196] (pl. 11) supports its attribution to the same workshop of **S38** and **S60**, which seems to have favoured the representation of seated figures, otherwise rare in Attica in the Archaic period.[197]

2. POSES

Throughout the Archaic period, free-standing statues were usually intended to be seen primarily in a frontal or profile view, seated or standing.[198] They were carved on a rigid vertical axis, and bound by the Archaic "law of frontality" which "required that an imaginary line drawn vertically through the middle of the figure, divides it in two equal parts, perfectly symmetrical, and that the weight of the figure, when standing, would be evenly distributed on both legs".[199] Figures, sometimes depicted taking part in actions such as fighting, racing, and dancing in architectural sculpture and reliefs, were shown either in a full profile view, or in an impossible anatomical pose, the torso in a frontal view and the hips and lower limbs in profile. This combination of frontal and profile views follows the "typical Archaic schema for a man,

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[196] Trianti, I., "Παρατηρήσεις σε δύο ομάδες γλυπτών του τέλους του 6ου αιώνα από την Ακρόπολη", *The Archaeology of Athens*, 83-91.

[197] Viviers, *Sculpteurs*, 209, 214-218. For the meaning and origin of seated figures in reliefs and large scale marbles, see Schmalz, *Grabreliefs*, 61-169.

[198] Kouroi and korai are shown either standing or walking. For korai represented more often standing and kouroi more often walking, see Sourvinou-Inwood, Chr., *'Reading' Greek Death: to the End of the Classical Period* (Oxford 1996) 241-242.

[199] Ridgway, *Archaic Style*, 12. For a definition of Archaic features in Greek art, see Hurwit, , J.R., *Art and Culture of early Greece: 1100-480 B.C.* (London 1985) 18-31.

the head in profile atop a frontal torso, and the torso atop profile legs, each individual part considered most recognizable that way".[200]

Although occasional attempts at breaking these conventional representations of the human figure are noticed from the early years of the sixth century, they are limited to some parts of the human body and do not reflect a close interest in an accurate rendering of the figure in motion. Some kouroi were set at an angle on their base, so that when the front of the base lies parallel to the spectator, they appear in a three-quarter view.[201] Ridgway notes that this device and the use of triangular bases,[202] were attempts "to encourage all-around inspection ... and to impart an impression of three-dimensionality and movement on an otherwise frontally conceived statue".[203] From the middle of the century, the weight of standing figures is sometimes on the advanced leg and the flank is set slightly forward to follow the leg;[204] while, among seated figures, riders may often turn their head laterally.[205]

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[200]Hurwit, *Ibid.*, 28.

[201]Athens, National Museum 2720, and bases with plinth and feet, Athens, National Museum 3645 & 3939, Richter, *Kouroi*[3], nos 2 & 5, 42, 45-46, figs. 33-39, 48-49. See also on the bases and their relation to the setting of the statue: Jacob-Flesh, M., *Die Entwicklung griechischer Statuenbasen und die Aufstellung der Statuen* (Waldsassen-Bayern 1969), and Kleemann, I., *Frühe Bewegung: Untersuchungen zur archaischen Form bis zum Aufkommen der Ponderation in der griechischen Kunst*, vol. 1 (Mainz 1984).

[202]Examples of triangular bases: Delos, Archaeological Museum A728, Richter, *Kouroi*[3], no 16, 53; Boardman, *GSAP*, fig. 56.

[203]Further discussion on their setting in a temple or sanctuary in Ridgway, "The setting of Greek sculpture", *Hesperia* 40 (1971) 338.

[204]Examples already appear in Richter's "Tenea Group", dated *ca.* 575-550: Richter, *Kouroi*[3], 75.

[205]The Rampin Rider: Paris, Musée du Louvre 3104 (head) and Athens, Acropolis Museum 590 (body and horse), *ca.* 550, Boardman, *GSAP*, fig. 114. Athens, National Museum 61, *ca.* 540-530, Eaverley, *Equestrian Sculpture*, no. 3, 81-85, pl. 7.

In the late decades of the sixth century, a growing interest occurs in suggesting figures in motion, which may be paralleled with the more accurate rendering of human anatomy. The representation of bodily poses is closely related to that of anatomical features because sculptors have to be well acquainted with anatomy, and understand the interrelation between the different parts of the human body in order to represent figures in lifelike poses. As was already noticed in Part 1, anatomical knowledge was not extensive during this period; and for this reason, sculptors, although interested in the rendering of motion, carved statues in anatomically impossible poses and do not achieve lifelike stances.

Naked standing males may have hips and buttocks raised above the weight-bearing leg (advanced or receding), but the rest of the trunk remains motionless and is still carved according to 'the conventional rigid vertical axis' and to 'the Archaic law of frontality' (**S53a, S57**) (pls. 64; 81). Although seated figures may be also represented according to a rigid vertical axis with only a slight rotation of the head and movement of the legs (**S56**) (pls. 78-79); riders press their thigh against the animal's flank, and the lower leg alongside the depression formed between the shoulder and the flank of the horse, and give the impression that they are actually riding (**S40**);[206] and the body of some seated figures is progressively carved more distinctly from the chair; in some cases, leaning slightly forward, with one leg flexed backwards, "ready to rise from its stool with a realistic air of imminent motion" (**S16, S17, S53b**) (pls. 10, 11, 68).[207] In figures taking part in 'violent' actions such as fighting,

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[206]See Eaverly, *Equestrian Sculpture*, 24.

[207]Boardman, *GSAP*, 82. According to some scholars, since the motion is enhanced when the flexed leg of the figure is seen in a three-quarter view, the whole statue was probably intended to be primarily seen in this view, Alford, H.L., *The seated figure in Archaic Greek Sculpture* (Diss. California 1978), 92; and Viviers, *Sculpteurs*, 165.

dying, running, or playing, sculptors gradually try to suggest the rotation of the body in a more naturalistic manner, and not in the Archaic combination of profile and frontal views. Among early attempts, the pedimental figures from the Acropolis (*ca.* 525-500), have been considered as "an extraordinary daring project dealing with the representation of movement",[208] because the sculptor tried to break with the old conventions (**S18**): although the body (trunk and lower limbs) of the striking Athena is shown in profile, her head and near-side foot is slightly flexed and turned towards the viewer (**S18a**) (pl. 12);[209] in the fallen giant (**S18b**) (pl. 13, 1), although depicted in the combination of frontal torso, and profile hips and lower legs, the sculptor emphasises the torsion of the trunk through the rendering of muscles. Yet, anatomical features follow an impossible combination - the chest in a frontal view combined with a contracted far-side flank, and the abdominal muscles carved without vertical and transverse divisions - similar to that noted in early red-figure vases and low reliefs (**S49, S53a & b**) (pl. 55),[210] which reflect the lack of anatomical knowledge of the body in motion. In the late decades of the sixth century, figures may be occasionally seen in a frontal or posterior view on low reliefs and architectural sculpture (west pediment of the Temple of Aphaia in Aegina), and with the torso slightly turning laterally in free-standing, (**S6, S12**) (pls. 3, 1; 5, 2), but the muscles are often depicted either in their more characteristic aspect, or in a combination of frontal and profile views and the changing shapes of contracted and extended muscles are not marked (**S6, S53a, S53c**) (pls. 2, 1; 44; 61; 63; 71).

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[208]Croissant, *REA* 95 (1993) 72. For discussions about the chronology, see 70-71.

[209]Other contemporary examples with near-side foot in a three-quarter view: **S10** and **S18e** (note the marble left below the flexed foot for security).

[210]Comparison between the rendering of the abdomen of **S18b** and that of figures by Psiax (**V62**, pl. 188, 1), Croissant, *REA* 95 (1993) 7.

Part 1 pointed out that, from the early fifth century, sculptors closely observed human anatomy and understand the human body as a whole. This growing anatomical knowledge is reflected in the representation of motion in marbles. In figures at rest, the balance of the body is scrutinised and indicated in a more naturalistic manner. The head, turned laterally, is combined with hips and buttocks at a slant (**S29, S54**) (pls. 30, 2; 25), and both legs slightly flexed (**S56**); in females at rest, the trunk may lean backwards to suggest that the weight is supported by the posterior leg (**S50, S53**), or slightly flexed and rotated laterally to reflect the balance of the legs (**S32**); the flexed leg is in a full frontal view and the extended one in profile (**S30**). Although it is impossible to reconstruct with certainty the stance of a statue from the feet alone,[211] it is worthwhile to mention a base with fragmentary marble feet (**S9**) (pl. 4, 1). They are set at an angle (one in a frontal view and the other in profile) and may also reflect a shift in balance of a body at rest. One extant statue, the 'Kritios Boy' (**S32**) (pl. 35),[212] summarizes all these experiments in an 'innovative weight-shifting pose' which is combined with an accurate rendering of human anatomy.[213] It has an advanced and flexed leg combined with an extended and weight-bearing one. The hips and buttocks are rotated and set at a slant,

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[211]Since a similar position of feet is displayed by Athena on the west pediment of the Temple of Aphaia, who is standing with the weight distributed on both legs. See Ridgway, *SS*, 31.

[212]There are three other marble torsos which have been compared with the Kritios Boy, but which are Roman copies of Greek originals. Berlin, Staatliche Museen 509, Blümel, *Katalog der Skulpturen, Romische Kopien*, vol. IV (Berlin 1931), K139, pl. 23. Rome, Museo Nazionale 652, a cura di Giuliano A., *Museo Nazionale Romano. La sculture*, vol. 1, (Roma 1979) no 50, 60, fig. 49. Boston, Museum of Fine Arts 22.593, Comstock, Vermeule, *Sculpture in Stone*, no 29, 19. For the comparisons, see Hurwit, *AJA* 93 (1989) 77-78.

[213]Hurwit, *AJA* 93 (1989) 72.

the convex chest, and the head flexed and turned laterally.[214] The trunk moves according to the pose of the legs: shoulders, chest, abdomen, and right flank are slightly flexed towards the weight-bearing leg, and the torso rotates laterally. The sculptor also understands how the balance of a body at rest may affect the shape of muscles.; how the buttock of the weight-bearing leg must be taut and higher, while that of the relaxed leg, slack and lower and how the muscles of the extended weight-bearing leg are contracted, while those of the flexed and "free" leg relaxed. Additionally, as outlined by Hurwit, the Kritios Boy, although "standing at rest, has a greater potential for movement than kouroi shown taking powerful strides...Seen in its left profile, the statue reveals a rather powerful forward lean, a suprising spatial depth, and an elegantly conceived rhythm."[215] While the pre or post-Persian date of this marble cannot securely be demonstrated, the statue clearly sums up the experiments with stance and balance developed from the last decades of the sixth century. It is also the forerunner of the Classical and even High Classical statues at rest,[216] such as the Doryphoros,[217] whose sculptor, Polykleitos, is credited with 'the invention of making statues which throw their own weight on one leg'.[218]

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[214]It is also usually acknowledged that both feet must have been flat on the ground, one in a frontal view (the weight-bearing), the other in profile, see Schuchhardt, *AMA* 191, and Ridgway, *SS*, 31.

[215]Hurwit, *AJA* 93 (1989) 70-71.

[216]Although most of the Classical youths turn their head toward the weight-bearing leg rather than to the relaxed one. See Hurwit, *AJA* 93 (1989) 70.

[217]Ridgway, *SS*, 31-32. Hurwit, J.M., "The Doryphoros: looking backwards" *Polykleitos* (1995), 11.

[218]Varro quoted by Pliny, *HN*, 34.56

In contemporary figures in action, sculptors show a similar understanding of how a "shift in pose may affect the placing of head, torso and limbs",[219] and break with the bi-dimensionality and one-view character of Archaic sculpture. Figures from the Athenian Treasury (**S68**), when in a three-quarter view,[220] are not carved in the old combination of frontal and profile views, but the body rotates and is shown in a combination of several viewpoints. Heads in near-frontal or near-profile view, extended or flexed, are combined with a torso and hips also in a three-quarter view, while lower limbs may be seen either in profile and both flexed, or one extended in a frontal view and the other in profile (*e.g.* **S68d-i-l-r-s**) (pls. 101; 103; 109; 111; 112). Running figures also break with the conventional representation of the *Knielauf* pose (see fig. 1).[221] The stance of the running girl from Eleusis - head turned laterally to the right, torso and hips in a frontal view with the extended leg rotated laterally and the flexed one in profile in the opposite direction, is considered to be the forerunner of running Classical figures such as the "Hekate" from the East pediment of the Parthenon, [222] and

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[219]Boardman, *Greek Sculpture. The Classical Period* (London 1985) 20-21.

[220]*F.D.* IV, 4, 237, note 8, only one human figure with a torso in a full front view is preserved **S68g** (pl. 102).

[221]In which head and torso are in a frontal view and hips and lower legs in profile: Nike from Delphi (**S66g**) (pl. 97), while the Nike of Kallimachos (**S30**) (pl. 31) strides more naturally, the head slighlty turned laterally, the leg less strongly flexed and the wings pointing back (rather than laterally), for the rendering of the Nikai. See Isler-Kerenyi, C., *Nike: der Typus der laufenden Flügelfrau in archaischer Zeit* (Zurich & Stuttgart 1969), 92-98, and for running females, Tölle-Kastenbein, R., *Frühklassische Peplosfiguren, Originale* (Mainz am Rhein 1980) 255-266.

[222]See Edwards, C., 'The running maiden from Eleusis and the early Classical image of Hekate' *AJA* 90 (1986) 317-318, and note 87.

combines several view points, which enhance the figure's movement.[223] As de la Coste-Messelière notes about the contemporary figures from the Athenian Treasury,

Fig. 1: 1. **S66g**; 2. **S30**; 3. **S69**

'l'axe des volumes corporels n'est plus rectiligne mais hélicoïdal..., les plans se sont multipliés, les masses tournent, comme s'ils leur fallait faire face de toutes parts'.[224]

Alongside these experiments, sculptors gradually understand how the shape of the muscles changes according to the pose of the figure. Despite the very slight rotation of the trunk of two marbles from the Acropolis (**S14**, **S36**) (pls. 8-9; 41),[225] the extension and flexion of the muscles are outlined. Where the neck is preserved, the muscles (sternocleidomastoid) are either contracted, or extended to allow the movement of the head, while the near-side pectoral and abdominal divisions are also slightly flexed. On both works,

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[223]As also does the pose of the Minotaur (**S68l**). The effort of the struggling figure is enhanced by its slightly twisted torso and hips seen in a forced frontal view, while its flexed head and non-weight bearing leg point to the opposite direction.

[224]*F.D.* IV, 4, 235.

[225]**S14** (pls. 8-9) is probably drawing the bow, while **S36** (pl. 41) has been

the off-balance of the figure is translated through the shift of the hips, and on (**S14**), the inferior muscle of the flank, above the flexed and raised leg, protrudes slightly over the iliac crest. The naked males from the Athenian Treasury depicted in more violent action also occasionally display muscles in motion. Although the rendering of anatomy of Herakles on (**S68u**) displays strong boundaries of anatomical features characteristic of the late decades of the sixth century,[226] his body shows a deeper knowledge of the muscles in motion than that displayed in earlier marbles. Below the raised arm, on the extended flank, the interdigitations of the muscles (external oblique and latissimus dorsi) are tightened and protrude through the flesh, while they are less visible on the flexed one (pl. 115). The flexed pectorals and flexed muscles of the abdomen and thigh are suggested, and the lower part of the abdomen is contracted since it is affected by the motion of the flexed trunk and flexed leg (at a right angle).[227] Yet, it must be noted that the specific shape of extended and flexed muscles is depicted only occasionally during this period, and the sculptor may combine, on the same figure, muscles which follow the motion of the body and others which are outlined in their more characteristic aspect, regardless to the pose (often the muscles of the abdomen, thigh and lower leg).

Although it is usually acknowledged that early experiments with figures in motion (dating from the last quarter of the sixth century) were developed mainly in architectural sculpture (in the round or low relief), and some low reliefs (votive or funerary), there are also a

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[226]For general discussion on the chronology of the Athenian Treasury and comparisons with vase-painting, *F.D.* IV, 4, 263-267.

[227]Already described by de la Coste-Messelière, for the fragment (**S68w**) in *F.D.* IV, 4, 234, note 5, who notes that "les muscles du ventre réagissent à l'action des cuisses plus visiblement que chez des personnages à peu prés contemporains (Egine) et même postérieurs

few examples in contemporary free-standing marbles. [228] The daring poses and the significant number of figures in motion in architectural and low reliefs may be explained by iconographical and technical factors. Narrative scenes, which usually adorn the buildings in sanctuaries (Temples and Treasuries), depict figures in 'violent' actions, such as battles, which forced sculptors to experiment with figures in more lifelike poses;[229] and figures may be shown in more adventurous poses in pedimental and metopal sculpture, because they were partly attached to the backdrops of the tympanum and to the background.[230]

(Tyrranochtones, "Zeus" de l'Artémision)".

[228]Robertson attributes their existence to the influence of pedimental sculpture, *HGA*, 162.

[229]About the known Gigantomachies and Amazonomachies which have adorned important late sixth century buidlings in sanctuaries, such as Delphi, Olympia, and the Acropolis of Athens, see *LIMC* IV (1988) 1, 191, 197-200, and *LIMC* I (1981) 1, 586, 593.

[230]In pedimental sculpture, when the gables are in marble and the building still in limestone, the figures are free-standing, see that from the Acropolis (**S18**).

B. BRONZES

Very few large-scale bronzes from the last quarter of the sixth and first quarter of the fifth century have been found in Attica (**B3, B20, B39**) (pls. 123, 137, 154).[1] Material evidence does not reflect the growing importance of bronze statuary during these years which is confirmed by the increasing number of bases for life-size bronze statues in the Athenian Acropolis.[2] It is, therefore, necessary to refer to figurines found in abundance in Attica but also to the few contemporary life-size statues from outside in order to trace the possibilities offered by bronze casting in the rendering of anatomy and poses. As already noted in the general introduction, large and small scale sculptures are grouped together and the differences in the rendering of anatomy and poses are pointed out at the end of Part 1 (Anatomy) and 2 (Poses).

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[1]Throughout this section bronzes larger than 50 cm in high are considered large-scaled since, from this size onwards, they are usually cast hollow and not solid, the latter being the common technique for statuettes (The largest known solid cast bronze (42 cm high) is a flautist from Olympia, dated to the third quarter of the sixth century: Athens, National Museum 16513, Mattusch, C.C., *Greek Bronze Statuary, From the Beginning through the Fifth Century B.C.* (London 1988) 48, fig. 3.15); see also Mattusch, *CB*, 9.

[2] Raubitscheck, *DAA*, 479

1. ANATOMY

According to literary and epigraphic sources, it was not unusual for sculptors during the late Archaic period to work both in marble and bronze, and from the material evidence, it seems clear that the anatomical knowledge acquired by bronze-casters is similar to that acquired by marble sculptors and described above.[3] In the last quarter of the sixth century, the combination of inaccurate and naturalistic anatomical features already noticed in marbles is paralleled in bronzes: the eyes are almond-shaped without tear-ducts; cheek-bones, when marked (**B2**) (pl. 121), are set highly on the face; the mouth is framed with a slight vertical depression at the corners; and the chin projects slightly beyond the rest of the face. On the male torso, the divisions of the abdomen may be four in number or reduced to three which is their natural number; and sometimes encircled in a deep boundary;[4] pubic hair, engraved or attached, follows the same star-shaped pattern as that described for marbles. From the early

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[3]For marbles, see 72-89. In addition, it is impossible to conclude about an earlier occurrence of a specific anatomical feature in one medium rather than another, when they are contemporary and have been usually dated by stylistic comparisons of one with another.

[4]As in marbles, (see p. 84), there are some bronzes with four rather than three abdominal divisions and the navel set below the lower intersection of the abdominal divisions (*e.g.* Zeus from Ugento, Taranto, Museo Archeologico Nazionale 121.327, the dates assigned to the bronze range from 530 to 510-500 to the early fifth century (530: Degrassi, N., *Lo Zeus stilita di Ugento* (Rome 1981) 99-106. 520: Rolley, *Greek Bronzes* (London 1981), 34. 510-500: Hermann, W., "Archäologische Grabungen und Funde im Bereich der Superintendenzen von Apulien, Lucanien, Calabrien und Salerno von 1956 bis 1966" *AA* 81 (1966) 293, 269. Around 500: *I Greci in Occidente*, no.77, 384. Early fifth century: Holloway, R., *Influences and Styles in Late Archaic and Early Classical Greek Sculpture of Sicily and Magna Graecia*

fith century, as in marbles, new anatomical details are rendered: tear-ducts are added in the eyes; the mouth loses its smile; the abdominal divisions are indicated in more natural and less decorative shapes; and the interdigitations of the muscles are added in the infra-mammary region (**B21, B22, B30, B31, B39**) (pls. 138; 145-146). Female bodies have triangular-shaped torso, narrow hips and small breasts; while feminine proportions are developed from the turn of the century. In the two examples of expressive faces, emotion is suggested with means similar to those described for marbles: with wrinkles on the forehead (**B21**) (pl. 138) and an open mouth (**B29**) (pl. 144); and is also limited to figures involved in fights.

Slight differences may, however, appear between the rendering in marble and that in bronze which are usually due to the influence and the possibilities offered by the technique rather than to the anatomical knowledge of the artists. A fluid and smooth rendering of musculature is developed earlier - from the last quarter of the sixth century - in bronze than in marble statuary. Except for the anatomical features of the face and torso which may have boundaries strongly marked, the muscles of the upper and lower limbs (biceps on the upper arm, brachioradialis on the forearm, the inferior border of the muscles of the thigh (vasti), the knee-cap and the subcutaneous border of the tibia) run smoothly into one another without leaving deep boundaries between them.[5] Yet, in these early examples, this rendering does not

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(Louvain 1975) 10.

[5](**B2,** face of **B6, B17**) (pls. 121; 133; 127). **B2** has been dated to 525-500 (Boardman, *GSAP*, 82), but also to 500-480 (Niemeyer, H.G., "Attische Bronzestatuetten der spätarchaischen und frühklassischen Zeit", *AntPl* 3 (1964) 24). There are also some exceptions which display emphasised anatomical boundaries (**B23, B24, B27**) (pls. 139; 141-142).

reflect a better understanding of how the various anatomical features interrelate, as it will in early fifth century sculptures (marble and bronzes), since muscles are still indicated in close decorative patterns. It is rather due to the technique used for modelling the clay or wax models of bronze sculpture: figures in wax or clay are made by addition of soft material and shaped by the pressure of the sculptor's fingers, while marble statues are made through the removal of superfluous material.[6]

The casting technique of large scale statues further allows the addition of eyelashes which is difficult in contemporary marble statuary.[7] Eyelashes are occasionally added on late sixth century large-scale bronzes,[8] and become the norm in early fifth century.[9] They are made through two techniques which cut or add them on the borders of the eyelids: either with separate strips of metal sheeting which are fitted into grooves cut into eyelids,[10] or with wedged shaped pieces of metal folded over into a core and clipped at the edges to suggest

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[6] Ridgway, *Archaeology* 19, no 1 (1966) 36, quoting Michelangelo's definition: we work marble "per forza di levare" - by way of removing -, clay "per via di porre" - by way of putting on.

[7]The only extant example in marble which has inlaid eyes combined with metal eyelashes is the Antenor kore, see Richter, *Korai*, 70, no 110 (**S26**) (pls. 23-25).

[8]Head dated to the last quarter of the sixth century with inlaid eyes and eyelashes: Zeus, Athens, National Museum 6440, Bol, P., *Grossplastik aus Bronze in Olympia*, *OlF* 9 (Berlin 1978) 10-12, pls. 3-5. On works dated to the second half of the sixth century, eyes may sometimes be cast solid: the mould from the Agora, and **B39** (pl. 154); and outside Attica, head from Sparta, Boston, Museum of Fine Arts 95.74, Boardman, *GSAP*, fig. 122.

[9]**B3, B20**, (pls. 123; 137), Athens, National Museum 11761 (pl. 298, 2) Philios, D., "Χαλκοῦν ἄγαλμα ἐκ Βοιωτίας" *AE* (1899), pl. 6.

[10]Delphian charioteer, *FD* IV, 5, pls. 16-17.

eyelashes.[11] In fact, the embellishing of the metal capsule which contained and secured inlaid eyes to their socket with eyelashes enhances the beauty of the figures, but was only a by-product of an essentially practical device.[12]

Although hair-styles follow fashions similar to those described in contemporary marbles, it has been already outlined that an accurate rendering of hair-strands seems easier in bronze than in marble statuary.[13] From the last quarter of the sixth century, hair is suggested in extremely finely chiselled strands (beard of **B3**) (pl. 123). Deep and light engraving may be combined to suggest a variety of thick and thin locks; small curls and wisps of hair are engraved as if clinging to the front of the ears and to the nape of the neck (**B20**) (pl. 137);[14] and coiffures may be also completed with parts cast solid and attached separately - wavy locks (**B35, B36**[15]),[16] snail-curls in relief,[17] chignons and head-gear, such as a warrior's helmet

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[11] Two warriors: (ca. 460-430) Reggio di Calabria, Museo Archeologico Nazionale 35502 (A) & 35494 (B), see *Due Bronze di Riace*, suppl. *BdA* (1984), pls. 12 (A), 38-39 (B). Remains of metal pieces edged with eyelashes in Olympia, and for a detailed explanation of the technique, see Bol, *OlF* 9 (Berlin 1978) 94-97, pl. 69. Mattusch, *GSB*, 183-185.

[12]Earliest known example of inserted eyelashes appear on the *sphyrelata* and in the ivory figure of Apollo from Delphi (*ca.* seventh century), see Themelis, P., *The Delphi Museum* (Athens 1981) 39. Inset eyes, but without eyelashes, already occur on griffin protomes, and occasionally on bronze figurines, see Mattusch, *Classical Bronzes: the Art and Craft of Greek and Roman Statuary* (New York 1996) 52, note 5. *e.g.*, "Mantiklos Apollo" (early seventh century), Boston, Museum of Fine Arts 3.997, Boardman, *GSAP*, fig. 10.

[13] For males, hair may be cut short (**B1, B2, B21, B22, B30, B31**) (pls. 119; 121; 138; 145; 147), or, tied in a chignon **B20, B32** (pls. 137; 149), or, as for females, loose over the shoulders (**B19, B23, B24**) (pls. 139; 141). For marbles see 72-77.

[14]For the development of similar features on the head of **S32**, see 82.

[15]Bathier thought that the *sphyrelaton* pointed to "a very early date for this metal wig" in "The bronze fragments of the Acropolis", *JHS* 13 (1892-1893) 243. However, others

(**B3**) (pl. 123) - which can be shaped more easily before being fixed.

Another difference consists of the use of coloured inlays in bronze statuary which, unlike the polychromy applied in stone sculpture, helps to increase the naturalistic appearance of the figure. Like the *sphyrelata* which preceded them, bronzes may have had anatomical details such as brows, eyes, eye-lashes, and lips inlaid or inserted. Some large-scale figures, usually dated to the first quarter of the fifth century, have brows of copper (**B3**),[18] and, in the same period, it was the normal practice to insert eyelashes and eyes, the latter composed separately from materials of contrasting colour.[19] Lips were outlined with copper (**B3**) (pl. 123), or made separately, especially on large statues. They were cast in an alloy,

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believe that these bronze strands may have been fixed to a large-scale bronze cast in the hollow technique, Bol, *OlF* 9 (1978) 19; and *JdI* 11 (1996) 60.

[16]Although strands cast separately were found on the Acropolis, one extant example of a head with attached strands is known to me, from outside Attica: Zeus, Athens, National Museum 6440, Bol, *OlF* 9 (1978) pl. 4. For the different forms of attached strands and their chronological development see also Bol, *Ibid.*, 12-20.

[17] Poseidon from Livadhostro, Athens, National Museum 11761, Philios, D., "Χαλκόν άγαλμα εκ Βοιωτίας", *AE* (1899) pl. 6; Zeus from Olympia, Athens, National Museum 6440, Bol, *OlF* 9(1978) pls. 3-5.

[18]*Ca.* 500-480: **B3**, and outside Attica: Berlin, Staatliche Museen 6324, Mattusch, *GBS*, 72-73, fig. 4.18 a-b. Poseidon from Livadhostro, Athens, National Museum 11761; Youth from Selinunte, Castelvetrano, City Hall: Hauser, C., *Greek Monumental Bronze Sculpture* (London 1983) 56-57. Zeus from Ugento, Taranto, Museo Archeologico Nazionale 12137, Mattusch. *GBS*, 67, note 43. See also, Bol, *OlF* 9 (1978) 90.

[19]Works in *sphyrelaton*, stone, wood and chryselephantine, bronze statues and statuettes may display inlaid eyes. However, on large scale bronzes they are developed from the last quarter of the sixth century when the technique is mastered (e.g.: Zeus from Olympia, Athens, National Museum 6440, and Zeus, Taranto, Museo Archeologico Nazionale 12137), see for details of the process, Haynes, D., *The Technique of Greek Bronze Statuary* (Mainz am Rhein 1992) 106, and Bol, *OLF*, 9 (1978) 93-96, with examples of isolated eyes found in

redder than the rest of the face such as in the Livadhostroto Poseidon.[20] Haynes reports that on some slightly later examples (*ca.* 480-450),[21] in which lips are parted, a silver inset was often used to represent teeth, but we do not know of any surviving example from around 525-480. Nipples on male statues were also often cast separately in an alloy rich in copper, close to the natural colour (Livadhostro Poseidon).[22] This technique aimed at greater naturalism. It may be seen occasionally in early fifth century marbles, such as on a centaur on the Athenian Treasury,[23] and, in this case, illustrates the influence of the bronze technique on marble.[24] Additionally, the gleaming brown surface of the bronze could also be exploited for visual effect. Mattusch notes that the shining surface of a nude bronze statue gave an appropriate illusion of the suntanned "bronzed" body of a male deity or athlete - popular subjects in this medium over the next decades.[25] The similarity between the colour of an athlete's skin and that

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Olympia.

[20]Bol, *OlF* 9 (1978) 90-91. Haynes, *Technique*, 108-109.

[21]Often in silver. Charioteer: Delphi, Archaeological Museum 3484, 3540, *F.D.* V (no mention of the teeth), Riace statues: Reggio di Calabria, Archaeological Museum, Formigli, E., "La tecnica di construzione delle statue di Riace", *Due Bronzi di Riace*, *BdA* 3 ser. spec. vol. 2 (1984) 135. For them, see Hauser, C., "Silver teeth: Documentation and significance' abstract", *AJA* 91 (1987) 300-301.

[22]Hauser, *Monumental Bronze*, 57. For statues dated to the second quarter of the fifth century: see Haynes, *Technique*, 110.

[23] Inlaid nipples, Delphi, Archeological Museum 73.

[24]And is not a "bizarre category" of metal inlays, as suggested by Ridgway, "Metal attachments in Greek marble sculpture", *Art Historical and Scientific Perspectives on ancient Sculpture* (Malibu 1990) 199.

[25]Mattusch, *GBS*, 98-99.

of bronze is further confirmed by a later writer, Dio Chrysostom, who in praising the beauty of a boxer, Iatrokles, compares him to a carefully made statue, his skin colour being the same to that of well-mixed bronze.[26]

Yet, a few gilt bronzes, mentioned by ancient sources and dating from the sixth-fifth cenury,[27] did not aim at naturalism but at the godlike appearance of the figure, since it is usually associated with statues which portray gods. [28] The use of gold for hair-patterns appears earlier in a mid-sixth century chryselephantine statue from Delphi, in which hair is added in sheets of hammered gold. Traces of gilt were also found in the pubic hair of the Piraeus Apollo at the moment of its discovery, and his hair was probably also covered with gold sheets.[29] The earliest known example with both hair and flesh gilt is an under lifesize head

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[26]D.Chr. (40-120 A.D.), *Orationes* 28.3

[27]Moses [Chorene, *Hist. Armen.* 2.11], says that Cyrus of Persia captured from Croesus of Lydia three gilt bronze statues (*simulacra quaedam aenea inaurata*) representing Artemis, Herakles and Apollo, see Overbeck, J., *Die antiken Schriftquellen zur Geschichte der Bildenden Künste bei den Griechen* (Leipsig 1868) 326. Paus. 10.18.7: Gorgias of Leontini, the long-lived sophist (*ca.* 485-380), dedicated a gilt statue of himself (ἐπίχρυσος δε εἰκων).

[28] Gilt statues remain rare until the Roman imperial period. See for examples from the fifth century, Mattusch, *GBS*, 28. For golden honorific statues of the Hellenistic period: Scott, K., "The significance of statues in precious metals in Emperor worship", *Transactions of the American Philological Association* 62 (1931) 101. For gold usually associated with gods in Archaic literature, see Manzelli, *La Policromia*, 80; and Reuterswärd, *Studien zur Polychromie*, 145, note 373, and 146-149 with further bibliography. *E.g.* Pindar describes Apollo with his golden strands (χρυσοχαῖτα), *P.* 2. 30.

[29]No traces were found on the hair, but the lack of engraving details and the three grooves found on the calotte, probably intended for the insertion of the edges of the gold foil, point to the use of gold sheets or gilding, see Dontas, G., "Ο χάλκινος Απόλλων του Πειραιά", *AKGP*, vol. 1, 189; and for the different gilding techniques used in bronze sculpture: Oddy, A.W., Cowell, M.R., Craddock, P.T., Hook, D.R., "The gilding of bronze sculpture in the Classical world", *Small Bronze Sculpture from the ancient World. Papers*

of a Nike, dated approximately to the 420s, found in the Athenian Agora and originally plated with gold foil.[30]

A significant number of bronze figurines was found on the Acropolis, while marble statuettes remain rare. Differences may be, therefore, pointed out beween large and small scale bronzes. They occur in hair-styles and in the rendering of anatomical features. Although popular, the coiffure with several rows of snail curls over the forehead is rare in bronze figurines which often have short straight (**B2, B19, B22**) (pl. 121) or wavy strands (**B21**, **B30)** (pls. 138; 145) over the forehead. Some anatomical details are often missed, while they are usually indicated in contemporary large-scale statues. On the face, eyes with tear-ducts are rare in early fifth century bronzes; the neck is usually shaped in a thick cylindrical form without muscles indicated;[31] the forearm is often flat, and the hands, ill-proportioned, with fingers not always distinguished. Anatomy is shaped in less accurate forms than those seen in the few large scale bronzes: the eyes have thick upper and lower eyelids, which, from the late sixth century, were incised or modelled;[32] pubic hair, when indicated, is suggested by a few

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delivered at a Symposium organised by the Departments of Antiquities and Antiquities Conservation and held at the J. Paul Getty Museum. March 16-19 1989 (Malibu 1990) 103-124.

[30]Athens, Agora Museum B30: first published by Leslie Shear, T., "The American excavations in the Athenian Agora: second report", *Hesperia* 2 (1933) 518-519. Recently with review of the earlier literature, Mattusch, *CB*, 121-125.

[31] I know of only two statuettes dated to the end of the first quarter of the fifth century which have a slender neck, with the insertions of one of the main muscles (sternocleidomastoid) indicated anteriorly (**B30, B31**) (pls. 146-147).

[32]In marble, thick upper and lower eyelids are developed only from around *ca.* 480, probably, as we have seen, under the influence of life-size bronzes, see 103.

careless incisions framed above by two concave curves **(B2, B17, B19, B21**) (pls. 121-122; 133; 138). The lack of anatomical detail and the occasional coarse rendering may be explained by the fact that it is difficult to mark small scale-figures but also by the nature of bronze figurines which are a modest undertaking commissioned by individuals, for personal dedications, and which could be supplied by less skilled craftsmen.[33] Although epigraphic and archaeological evidence confirms that famous bronze makers, such as Onatas, made both large and small-scale bronzes,[34] and some bronze figurines are fine works, it seems reasonable that lifesize bronzes, which were an expensive undertaking, regularly commissioned by the *polis*, were supplied by the most prestigious sculptors and therefore display a high quality of work, while small-bronzes may have been usually supplied by less talented craftsmen.

As in marbles, a distinctive hair-style and rendering of anatomy may help to group several bronzes together and attribute them to the same workshop. Hair styled in oblique waves over the forehead, with a parting in the middle (**B6**) (pl. 127)[35] is a coiffure rare in

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[33]See for the different purchasers and functions of bronze statuary, Rolley, *Bronzes*, 23.

[34]A base with the signature of the bronze-maker Onatas was found on the Acropolis and bore traces of four bronze dowels, probably to bear a horse in bronze. The base was found in the *Perserschutt* and dated to the first quarter of the fifth century. Its dimensions are 34,5 x 15,4 cm, and the holes for the dowels which fix the feet of the horse measure approximately 15 cm and, hence it belongs to a statuette. Athens, Epigraphical Museum 6263, Raubitscheck, *DAA*, no 236. Walter-Karydi, *Alt-Ägina*, no 11, 21-22, pl. 2A. (The measurements of the dowels holes were kindly provided by Dr. D. Viviers).

[35]Outside catalogue, Athens, National Museum 6451, Athens, National Museum 6576. Niemeyer, *AntPl.* 3 (1964), 17, pl. 5, 34c. de Ridder, A., *Catalogue des bronzes trouvés sur l'Acropole* (Paris 1896) 248-249, no 703,fig. 220.

contemporary marble korai.[36] It occurs in two figurines portraying Athena Promachos which also have other common features, such as a thin oval face, almond shaped and thick eyelided eyes, a thin long nose and emphasised chin, and which were, accordingly, attributed to a same workshop.[37] In a similar manner, several male figurines may be grouped together (**B23, B24, B27**) (pls. 139; 141-142) and attributed to one bronze-maker. While it was noted that a smooth rendering of anatomical features was developed from the late sixth century in bronzes, the boundaries of musculature are strongly marked in these statuettes, which also share an oval face narrowing slightly at the chin, wide open eyes, flat cheeks and chin, and a mouth drawn downwards.[38]

The Piraeus bronze, (**B39**) (pl. 154), does not take advantage of the possibilities offered by bronze technique in the rendering of hair and eyes. The strands are suggested by simple flat waves, the only engraving being on the three short locks in front of the ears, and eyes are cast solid. These two features (flat hair-rendering, and solid eyes) are usually seen in early bronze heads (*ca.* 550-530) for which the bronze maker did not master the large scale

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[36]Only one example known to me: the Euthydikos kore (**S28**) (pl. 28).

[37]Compare **B6** (pls. 127-128), and Athens, National Museum 6451, Niemeyer, *AntPl* 3 (1964) pl. 5. Yet, for a cautious use of "workshop" with regards to this group of works, and the relation between NM 6451 and **B6**, see Rolley, "Statuette d'Athéna Promachos" *RA*, fasc.1 (1968) 45-47. Niemeyer, *AntPl.* 3 (1964) 11, 16-17. Other examples, which display a similar hair-style but not similar anatomical features, were attributed to different regional schools: St Petersburg, Hermitage Museum B815; Boston, Museum of Fine Arts 04.7 and 01.74.83, Walter-Karydi, *Alt-Ägina*, 105, figs. 162-164.

[38]Rolley, *RA* fasc. 1 (1968) 47. Further connections, with **B2, B30, B3,** although not so close as to suggest a common hand but rather a common "workshop", see Rolley, *ibid.*

casting technique yet.[39] Additionally, the hair-style of **B39** may be only paralleled with that of mid-sixth century marbles. The short spiral locks over the fillet on either side of the forehead recall those of the Nike from Delos;[40] the undecorated mass of hair at the temples that of several heads which belong to Richter's Melos group (ca. 555-540);[41] and the narrow flat strand in front of the ears which is like a sideburn, may be related to a marble kouros head also dated to the middle of the sixth century.[42] Even if it is not clear whether the calotte and some of the strands were intended to be seen with this appearance or whether painting was "originally used to define and elaborate the 'doughy' locks",[43] and whether the rest of the head was covered with sheets of gold since there are still traces of gilt on the pubic hair,[44] the coiffure of **B39** may be only related with those of mid-sixth century heads. On the other hand, the smooth modelling of the anatomical features and the pose of the figure (with arms stretched out and a slight ponderation), point to a later date, in, at least, the late sixth century.

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[39] See discussion about the dates of the statue which vary from the late sixth-early fifth century to the early first century B.C., Mattusch, *GB* 136-140, and about the technique, *Ibid.*, 130-131.

[40]But with incised strands, Athens, National Museum 21, Isler-Kerenyi, *Nike*, pls. 13-14.

[41]For both features see Dontas, *AKGP*, vol. 1, 184. *E.g.* Athens, National Museum 10, Richter, *Kouroi*[3], no. 95, 100, figs. 306-311. Kontoleon, N., "Zur archaischen Bronzestatue aus dem Piräus" *Opus Nobile. Festchrift zum 60. Geburstag von Ulf Jantzen*, ed. Zazoff, P. (Wiesbaden 1969) 95, pl. 15.

[42]Mattush, *CBS* , 76, note 73. *E.g.* Athens, National Museum 16, Richter, *Kouros*[3], no 101, 10, figs. 322-323.

[43]Haynes, *Technique,* 114.

[44]Dontas, G., "Ο χάλκινος Απόλλων του Πειραιά", *AKGP*, vol. 1, 189.

The varying dates suggested by the old-fashioned hair-style, the cast eyes and by the pose and the rendering of anatomy have been seen as an Archaistic feature: scholars have proposed dates for this statue which go from the last quarter of the sixth to the second quarter of the fifth century, and occasionally to the beginning of the 1st century.[45] The latest date must be excluded because of two technical criteria: the statue was cast in two pieces (such a technique is paralleled only in the Archaic mould from the Agora - dated to the third quarter of the sixth century); and used an alloy, without any lead, which also indicates an early date.[46] The combination of ponderation and smooth anatomical features with an old fashioned hair-style, may indeed point to an Archaistic trend which may be explained by the subject portrayed, usually acknowledged as Apollo. It is likely that the bronze-maker consciously carries on features which recall an earlier representation of the god, while he shows a greater freedom in the rendering of the body.[47] In addition, Archaistic trends seem to be developed during the first and second quarter of the fifth century. Some figures in bronze (**B4**), relief (**S11**) and vase-painting[48] may wear an old fashioned hair-style: long hair tied with a ribbon (**B4**, **B19**)

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[45]Last quarter of the sixth century: Mattusch, *GBS*, 75-78. First quarter of the fifth century: 500-480, Kontoleon, *Opus Nobile*, 95. 520-500: Mattusch, *GBS*, 75-78. In her last monograph Mattusch revised her opinion and dated it from the first century, *CB*, 138-140. The same date was originally proposed by Rolley, *Bronzes*, 36, who now dates it to the second quarter of the fifth century, *Sculpture*, 399 .

[46] Dontas, *AKGP*, vol. 1, 181-184. Mattusch, *GBS*, 75-78.

[47] Dontas considers this statue a copy of an earlier cult statue. Dontas, *AKGP*, vol. 1, 191.

[48]About **S11**: "This relief is the earliest example of a phase of Greek art which we call archaizing or archaistic, first appearing in the final stage of archaic art", Brouskari, *The Akropolis Museum*, 53. In vase-painting, on some vases attributed to the "Mannerists" for instance, Artemis: The Pan Painter, Boston, Museum of Fine Arts 10.185, *ARV*^{2} 550, 1; 1659;

(pls. 124; 136) which is a coiffure usually seen only in early works, marbles or bronzes, dated to the second quarter of the sixth century.[49]

2. POSES

From the early sixth century, bronze statuettes show a greater freedom in the representation of movement and use of space than free-standing marbles.[50] This freedom of pose mainly consists in having upper limbs raised and held free from the body, and lower limbs striding forward. It was made possible by the greater tensile strength of the medium and by the casting technique employed. In marble statuary, when the upper limbs are strongly flexed, the forearm is either carved separately and inserted into a socket at the bend of the elbow in order to eliminate excessive use of stone (**S28**) (pl. 27), or must be supported by struts and props. Both devices, are necessary in stone sculpture in order to avoid the risk of breaking;[51] and made the representation of bold gestures more difficult than in bronze

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Para 386; *Add*^{2} 256, see Robertson, *HGA*, pl. 86b.

[49]Youth: Berlin, Staatliche Museen A2 (575-560). Head of a discus-thrower (*ca.* 560), Richter, *AGA*, 21, nos. 24-25, figs. 77-79. Female (600-570): Berlin, Staatliche Museen 1800, Richter, *Korai*, 39-40, no. 42, figs, 139-146.

[50] For early examples dating from the end of the 8th- beginning of 7th century, see a helmet-maker, New York, Metropolitan Museum of Art, Fletcher Fund 1942, Mertens, J.R., "Greek bronzes in the Metropolitan Museum of art", *BMetrMus* 43 (1985) 19. For sixth century examples, young girl running from Dodona (*ca.*550), Athens, National Museum 24, see Rolley, *Bronzes*, 108, fig. 79; running female, Palermo, Nuseo Archeologico Nazionale 8265, Rolley, *Bronzes*, 126, fig. 103 For late sixth century examples, see the runner from Samos, Vathy Museum B232 (*ca.* 510), Thomas, R., *Athletenstatueten der spätarchaik und strengen Stils* (Rome 1981) pl. 1,1.

[51]Ridgway, *Archaeology* 19, no 1 (1966) 32, and *eadem, Art Historical and Scientific*

figurines.

Yet, except for these gestures made possible by the material, the poses of bronze statues are similar to those described in marble statuary. They do not reflect a greater anatomical knowledge; and bronze figures in action or at rest conform to the same conventions, and share a similar development towards a more naturalistic rendering. Figures at rest are cast on a rigid vertical axis, feet resting flat on the ground. Except for their head occasionally slightly turned and flexed,[52] and for the extended upper limbs, this frontal stance is hardly a more animated pose than that of a marble kouros. Figures in motion, the number of which increases significantly by the turn of the century, are constructed on a simple plan in which the various parts of the body are shown either in a frontal or lateral view (**B6, B25**) (pls. 127-128). Both statues at rest and in motion have their weight either borne by one leg (**B23, B24**) (pls. 129; 141) - usually the backward one for figures in motion (**B38**) (pl. 153), or distributed equally on both. The occasional attempts in the late sixth century to show the body in a slight rotation reflect a similar misunderstanding of its structure as that noticed above for contemporary marbles. The large scale Zeus from Ugento strides forward, left leg advanced, right arm rised, and left extended forward; the head and lower limbs in profile, the torso rotates slightly, the neck and hips of the statue being unaffected by the movement of the torso and limbs. [53] As noted by Mattusch, "the figure's stance is vertical, the weight balanced directly

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[52] Male runner, Berlin, Antikenmuseen, without inventory number, Thomas, *Athletenstatuetten*, pl. 1, 2.

[53]Taranto, Museo Archeologico Nazionale 12137, see pl. 300, 1.

over the legs, which gives the gesture a certain rigidity...and no convincing forward movement is indicated."[54] The growing interest in the body in motion also occurs in some contemporary bronze handles in which impossible anatomical combinations are used to emphasise motion. An example in the catalogue (**B18**) (pl. 134) portrays a satyr squatting with his head in a full frontal and body in a full posterior view.

It was noted that, as in stone sculpture, the development of a more accurate rendering of anatomical features is pursued in the early fifth century; and it is from this period that bronze-makers understand how the body moves and how ponderation and motion may affect its different parts and anatomy. Although often represented with both legs extended, figures at rest may have the hip and shoulder slightly raised over the advanced lower limb, (**B1, B2**). The interest in the balance of the standing figure further extends to contemporary mirror stands or handles. Although their function of supporting a polished mirror or patera should have restricted them to a strict frontal view, these "caryatids" may occasionally display, from the early fifth century, a slight rotation of the trunk, combined with one leg everted, and the other motionless (**B37**) (pl. 150). Attempts to suggest the balance of the body with one leg flexed, the other extended and weight-bearing, are also seen in both large and small scale bronzes from the early fifth century. (**B5**) (pl. 126)[55] combines a flexed and extended leg with head and trunk rotated slightly laterally, while shoulders and hips are raised above the weight-bearing leg. Its pose has been compared with that of the Angelitos Athena (**S3**) (pl. 1, 2). The stance of the

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[54]Mattusch, *GBS*, 69-70.

[55] Usually dated to the end of the Archaic period, *ca.* 490-470.

Poseidon of Livadhostro is close to that of the Kritios Boy (**S32**) (pls. 35-36):[56] both turn their head almost imperceptibly to the right, slightly rotate their body, and raise their hips above the weight-bearing leg. Yet, the shoulders of the bronze are at a slant, following the movement of the hips, and the arms are extended and raised, while the shoulders of the Kritios Boy are motionless and his arms lying along his body. This slight difference does not point to a later date for the bronze,[57] but must be rather explained by the technique used since most of these features (such as the flexion of the head and the raised arms) may be seen in Late Archaic bronze statuettes, and the rendering of his facial features is close to that of the Athenian bronze head from the Acropolis and of some heads from the West pediment of the Temple of Aphaia, all of which are dated to the first quarter of the fifth century. Further evidence of the interest in the ponderation of the body at rest is provided by the imprints of the feet of bronze statues on the bases which support them,[58] and which are dated to the first quarter of the fifth century:[59] the feet are set at an angle (one everted, and perpendicular to the other) and probably belong to figures with a shift in balance.

From the early fifth century, the rotation of the body is gradually suggested in a more

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[56]Both turn their head almost imperceptibly to the right, slightly rotate the body, and on both, the hips follow the balance of the weight. See Houser, *Monumental Bronze*, 63, and Mattusch, *GBS*, 81.

[57] Sometimes dated to the second quarter of the fifth century, Boardman, *GSAP*, 53.

[58] For the holes for bronze dowels and the technique of fastening the statue, see Bol, *OlF* 9 (1978) 85-87.

[59] Athens, Agora Museum I 1597, Thompson, H.A., Wycherley, R.E., *The History, Shape and Use of an ancient City Center, Athenian Agora* 14 (Princeton 1972) pl. 167b. Athens, National Museum 6944 (dedicated by Kallias), Raubitscheck, *DAA*, no 111.

lifelike way, and the anatomically impossible combination of frontal and profile views become rare. Running figures gradually depart from the conventional *Knielauf* pose;[60] and other figures in action, such as the fighting giant, (**B21**) (pl. 138), combine different views. In (**B21**), the head turns laterally, the torso and the weight-bearing leg rotate to the opposite direction, and the flexed and advanced leg is inverted, and the raised hand, which holds the stone, is at right angles to the plane of the arms. As noted by Payne when speaking about the pose of a later statuette of Zeus at the Benaki Museum, "the three-quartering of the body is an important point which alters the whole character of the movement... the figure is not any more composed in strict relation to one or other of two planes, the one parallel, the other at right angles to the 'plane of vision'."[61]

While it is clear that the interest in lifelike poses in both marble and bronze statuary with the growing concern in an accurate rendering of human anatomy, bronze-makers introduce more daring attitudes in athletic statuary than those seen in marble statuary. They emphasise the momentary aspect of an action about to take part, and figurines are depicted in sporting activities such as running, wrestling, discus-throwing, and spear-throwing;[62] new types of figures in motion are introduced in bronze from the end of the first quarter of the fifth century.[63] Runners at the start are aligned with their bases, for their action proceeds in a

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[60]**B14, B15** (pl. 131).

[61]Payne, H.G., "A bronze Herakles in the Benaki Museum at Athens" *JHS* 54 (1934) 165-166.

[62]For athletic statuettes throughout Greece, see Thomas, *Athletenstatuetten*.

[63]See also Mattusch, "The Berlin Foundry cup: the casting of Greek bronze statuary in

straight line. The legs are positioned closer together than those of attacking gods, with the center of balance inclined forward, both arms extended, palms down, in front of the figure (**B30**) (pls. 145-146).[64] Other pivoting figures are found primarily among the statuettes of diskoboloi, although relatively rare. The discus-thrower from the Acropolis (**B31**) (pls. 147-148) does not merely combine frontal and profile views of the different parts of the body, but several oblique views. The right arm, now partly missing, has lowered the discus to throw, and the youth steps back firmly on his left foot while pivoting on his right one, also missing, but once planted solidly on the ground. The left arm, raised and flexed at shoulder level, emphasizes the twist of the body. The diagonal placement of this diskobolos across its small squared plinth reinforces our need for multiple and continuing viewpoints.[65] As noticed by Rolley, this bronze seems "animée d'une rotation qui va préssentir l'envol du disque",[66] and parallels may be only found in some disc-throwers painted by Euphronios a few decades earlier. In fact, bronze figurines from the early decades of the fifth century, are often shown in a phase of violent action, bronze-makers taking advantage of the tensile strength of the medium, while sculptors of marbles restrict the pose of their figures, also portrayed in athletic action, to small movements (slight rotation of the torso, slight movement of lower limbs)which

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the early fifth century B.C.", *AJA* 84 (1990) 442-444.

[64]For examples outside Attica, see Thomas, *Athletenstatuetten*, 40, pls. III.1, IV. 1, V.1.

[65]Konstantinou, I.K., *Ρυθμοί Κινήσεων και λοξαί στάσεις εις την αρχαιότεραν Ελληνικήν πλαστικήν* (Athens 1957) 39-42. Mattusch, *GBS*, 116.

[66]Rolley, *Sculpture*, 329.

still reflect, to some extent, the configuration of the block of stone.[67]

Very few large-scale bronzes are preserved from Attica as well as from outside, and the only known example of a figure in motion is the Zeus of Ugento which follows the conventional pose of a striding figure. From this single bronze, scholars noted that there is a contrast between large scale and small scale bronzes, the complex movements and marked torsion of which make them strongly three-dimensional. Various explanations have been given. Mattusch notes that "differences between the types represented in statuettes and in large-scale bronzes are probably due more to independent stylistic traditions than to differences in methods of production",[68] and makes a distinction between makers of large bronzes and makers of bronze statuettes, whom she considers to be different craftsmen.[69] On the other hand, Rolley cautiously remarks that discrepancies in style may be partly due to the different scales which also imply a different technique but must be explained by the date of the bronzes. Writing about the diskobolos (**B31**), he notes, "Sans doute une telle hardiesse est plus facile sur un petit bronze que sur une statue de taille naturelle; mais elle est symptomatique surtout si on tient compte des dates."[70]

It is, indeed, difficult to draw conclusions about the poses of large scale bronzes given

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[67] See, sculptures from Delos: Hermary, A., *Exploration archéologique de Délos faite par l'EFA.. La sculpture archaïque et classique*, vol 1 (Paris 1984), 8-12, pls. 4-8; and **S35, S36, S48** (pls. 40, 2-41; 53-54).

[68] *GBS*, 213.

[69] *CB*, 21.

[70] Rolley, *Sculpture*, 329.

the lack of evidence. Two points must be, however, raised before concluding as to the contrast outlined in previous scholarship between life-size bronzes and statuettes. It was noticed that bronze-makers introduced new poses in athletic statuary from the early fifth century. The large-scale bronze (the Zeus of Ugento), usually dated to the last quarter of the sixth century, and compared with them, is not an athlete, but portrays a striding god, a subject which is also shown in a more conventional pose in figurines.[71] In order to make the comparison valid, it is important to attempt the reconstruction of early fifth century life-size athletic statuary in order to confront it with contemporary athletic figurines, while a second point which must be examined is the difference between the casting techniques used in large and small scale bronzes and their influence on the style of the figure.

Although the very few large bronzes usually mentioned for this period are figures at rest or striding gods, it is possible to conclude from the little material evidence that survives that bronze-makers experimented in athletic large-scale bronzes with poses similar to those seen in statuettes from the early fifth century. The limbs, preserved in fragments, of a bronze statue, approximately half lifesize, belong to a discobolos which must have been portrayed in a "rotating" pose similar to that of the statuette (**B31**) (reconstruction fig. 1).[72] Despite the fact that it is difficult to reconstruct with certainty the stance of a figure from the feet alone, a base from the Epigraphical Museum in Athens bears dowel holes for feet which belonged to a

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[71]**B6, B7, B8, B38** (pls. 127-128; 152-153).

[72]Athens, National Museum, unknown inventory number, see Konstantinou, *Ρυθμοί Κινήσεων*, 44-45.

statue, which was also probably in a pose similar to that of the discobolos (**B31**) (fig. 1, 2).[73] The lower limbs stride forward, with the advanced foot turned slightly to the right, while the backward foot is set almost at right angles, a stance which probably reflects the rotation of the body.

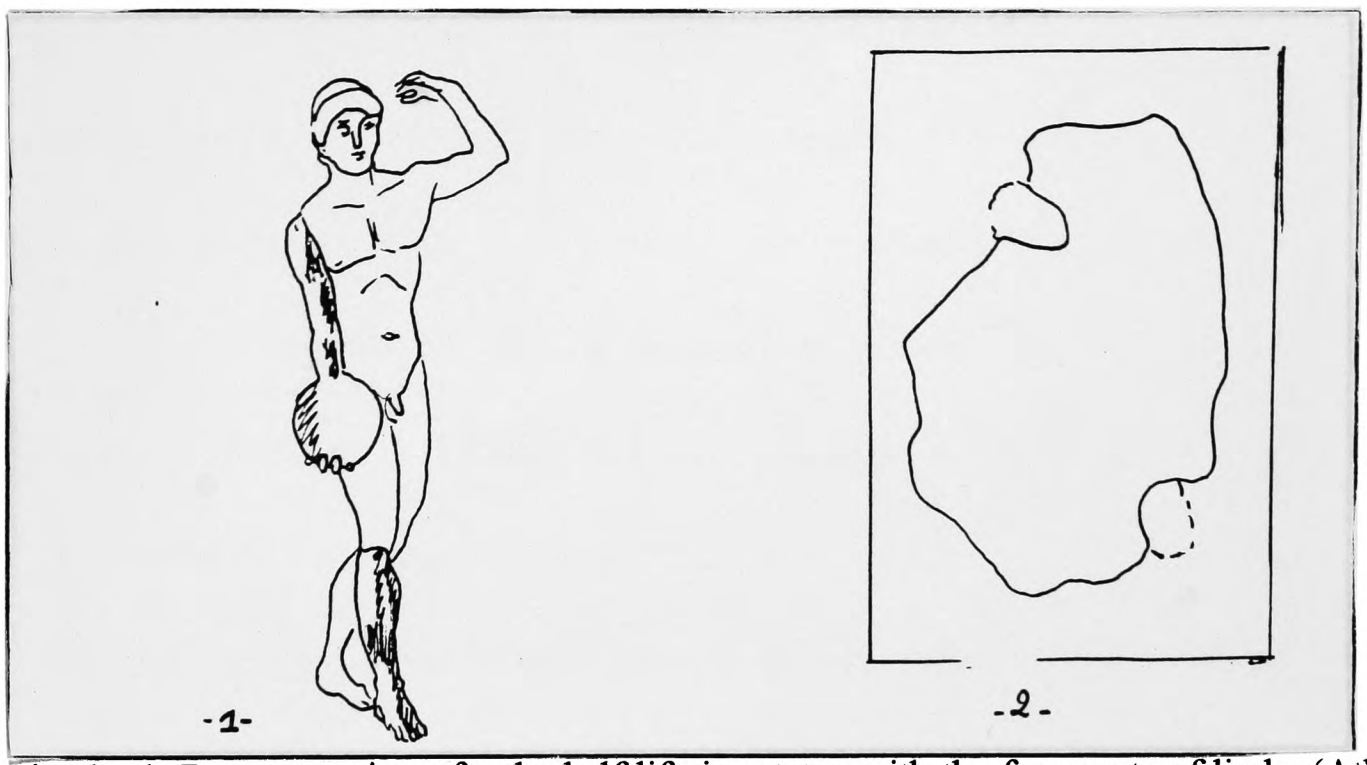

Fig. 1: 1. Reconstruction of a the half lifesize statue with the fragments of limbs (Athens, National Museum) by Konstantinou, *Ρυθμοί Κινήσεων*, 44
2. Base, Athens, Epigraphical Museum 4469

Last but not least, an early fifth century Attic red-figure kylix, attributed to the Foundry Painter, depicts the assembling of a bronze statue which has been cast in separate parts.[74] The finished statue would apparently have been lifesize and represents an athlete in action, perhaps a runner or a jumper, its pose closely recalling that of a contemporary bronze

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[73]Marble column with holes for the dowels of bronze feet: Athens, Epigraphical Museum 4469a, *ibid.*, 35-36, figs. 18a-b. The inscription has been completed as the signature of the sculptor Euthymon, Raubitscheck, *DAA*, no 277.

[74]**V24** (pls. 177, 2; 178, 1). For a detailed analysis of the iconography of this cup, see Mattusch, *AJA* 84 (1980) 436-444, and idem, *GBS*, 104-105.

statuette (**B30**) (pls. 147-148):[75] the body, in profile, turns slightly to the right, with arms extended forward, and legs slightly flexed. The extended feet in the vase-painting further suggest that the statue would be fixed to its base only by the extremities, something which was not possible in marble, and which may be compared to the description we have of a bronze runner by Myron.[76] Literary sources, also point to the role of bronze statuary in the development of motion, even though they refer to slightly later artists and works, usually dated to the second quarter of the fifth century. We have seen, that according to Diogenes Laertius (**T15**), Pythagoras of Rhegion, a sculptor praised for his bronzes and his representation of athletes, is admired for his experiments with violent motion,[77] and considered to be the first to suggest ῥυθμός.[78]

The technique used in small-scale bronzes, indeed, allows a greater freedom of poses than that in large-scale. Until the end of the sixth century, the latter was cast hollow in only a few separate pieces, and movement had to be restricted in life-size statues in order to minimize the size of the casting-pit and the furnace required to melt the bronze; and in order to simplify the pouring, so that the molten metal would not solidify before the mould was completely filled. Thus, it seems that throughout the later half of the sixth century, the poses

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[75]For other bronze parallels, see Harrison, E. B., "Early Classical sculpture: the bold style", *Archaic,* 56 note 9.

[76]**T24**: Full of hope is he, and he shows that the breath on the tip of his lips comes from deep within the hollow of his sides. The bronze is ready to leap forth to gain the crown, and the base shall not hold it back. Oh Art, swifter than the wind! (trad. Paton, Loeb).

[77]DChr 37.10.

[78]DL VIII.46.

of lifesize bronzes, including figures of victorious athletes, closely resemble those of marble sculpture: both are limited to simple standing, striding or seated figures.[79] Bronze-makers had not yet realized the opportunities offered by the medium, and were probably not prepared to experiment with daring poses in a material which was still unfamiliar with large scale, and with which they could encounter technical problems. As noted by Mattusch, a hollow-cast statue of half lifesize was a new development in the mid-sixth century, and represented a major technical achievement, even without experiments in poses.[80] In contrast, bronze statuettes were cast solid and bronze-makers did not deal with the risks encountered in hollow casting large-scale. They modelled a figure in solid wax and covered it in a mould of fire-proof clay, in which a hole was pierced; the mould was then baked to melt out the wax and the bronze poured in. It was as simple as modelling and carving a figure in wax, and the makers of statuettes had the opportunity to make changes while work was in progress. Yet, we have seen that the freedom enjoyed in making small scale figures did not lead bronze-makers to introduce lifelike poses but only to portray figurines with extended arms and striding legs.

We have seen that lifelike poses are developed in the early fifth century in both large and small bronzes, and coincide with the introduction of the piece-casting technique in life-size bronzes which also allows a freedom of pose.[81] Evidence of piece-casting in Greek statuary of the early fifth century is provided not only by the few lifesize bronzes preserved, but also by

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[79]See for example, the mould of a kouros from the Athenian Agora: Athens, Agora Museum S 741, Mattusch, *Archaeology,* 30 (1977) 326-332.

[80]*GBS*, 58.

[81]Haynes, *Technique*, 48-49.

the contemporary red-figure kylix mentioned above which depicts in detail the activities of metalworkers.[82] In fact, in the piece-casting process, the sculptor first makes a model (probably in clay); piece moulds are then taken from the model, which are used to make wax impressions, which are cored, invested and cast.[83] In the final stage, the statue is assembled. The piece-casting technique uses pieces which are not necessarily large; reduces the risk of misscasting; and enables the bronze-maker to restrict himself to relatively small and simple moulds, and to melting-furnaces and casting-pits of modest dimensions.[84] As outlined by Haynes, this technique provides the technical basis on which bronze statuary was able to develop in Greece with unprecedented quantity and to attain a greater freedom of poses since the statue no longer needed to be self-contained in order to minimize the size of the casting pit.[85] It seems, therefore, clear that there is not an independent stylistic tradition for figurines and statues since both large and small scale bronzes show, at least from the early fifth century,

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[82] **V24** (pls. 177, 2; 178, 1). Although much later than the early fifth century, some literary sources also refer to the reduction of statues in pieces: Ph. Byz., *Mir*, 4. Quint, *Inst.*, 2.1.12, 7.1.2.

[83]According to Haynes, the indirect lost-wax technique, in which neither the model nor the moulds took part in the actual casting-process was developed already in the early fifth century. Haynes, *Technique*, 42-53. Mattusch believes that early fifth century bronzes were made with an intermediary process in which a rough model was made first, moulds were taken of it in several pieces and then details were reworked before pouring, *GBS*, 216, also followed by Rolley, *RA* (1995) 441.

[84]About remains of early fifth century bronze workshops in the Kerameikos and the South Slope of the Acropolis, see Zimmer, G., *Griechische Bronzegusswerkstatten zur Technologieentwicklung eines antiken Kunsthandwerks* (Frankfurt am Mainz 1990) 34-38; 62-71.

[85]*Technique*, 48-49.

similar lifelike poses and momentary actions in athletic statuary, and there is evidence of bronze-makers working in both sizes.

Given the development of lifelike poses in athletic statuary, scholars have sometimes considered that the growing popularity of this theme in bronzes played an important part in the introduction of figures in action. It is likely that sculptors interested in the body in motion focused on athletic subjects which offered them a wide range of possibilities in experimenting with new poses, but the subject alone did not develop this interest as it is further confirmed by literary and material evidence. Ancient texts report that athletic statuary was introduced in the 3rd quarter of the sixth century at Olympia. Statues were initially made of wood[86] and then stone,[87] but the tradition was soon established in bronze. According to Pausanias,[88] the marble statue of a victorious wrestler (dated to 54th Olympiad) adopts a kouros stance; and the earliest known large-scale bronze, no more than a large statuette found in Olympia, seems to follow conventions and traditions imposed by the use of stone:[89] it is standing the left leg advanced, and the right fist, thumb forward, clenched against the upper thigh. It seems, therefore, that the theme chosen was only a means used by artists, to experiment with bodily motion which was, along with a more accurate rendering of anatomy, what they were primarily interested in.

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[86]Paus. 6.18.7.

[87]**T22**

[88]**T22**

[89]Dated *ca.* to the middle of the sixth century, Bol, *OlF* 9 (1978) 53, note 10.

C. TERRACOTTAS

A significant number of cheap mass-produced terracotta figurines, protomai and pinakes have disovered in Attica, and head-vases from the last quarter of the sixth century. There is little evidence of large-scale statues in clay; and Athens, unlike Corinth,[1] the sanctuary of Olympia[2] and some West Greek colonies[3] which produced both architectural and free-standing sculpture in clay, provides us only with two very fragmentary pieces of slightly under-lifesize works found in the Agora and on the Acropolis (**TC1, TC24**) (pls. 155, 1; 165, 2). Although it might have been useful to examine large-scale statuary in clay and undertake comparisons with contemporary bronzes in order to outline the possibilities offered by the modelling technique in the rendering of anatomy and poses, both media originating from a clay model, reference to terracottas from outside Attica will not be made since it seems that this medium in large-scale was not as popular as contemporary bronzes in Athens.

Before considering the terracotta figurines, it must be pointed out that, while the method of dating them is similar to those used for other media (by comparison with objects found in a same tomb and with other material with absolute dates), their chronology may encounter specific difficulties. Because additional moulds could be taken from the earliest

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[1]Amazonomachy pedimental group: Corinth, Archaeological Museum MF-1946, Group of human figures, dying Amazon, Corinth, Archaeological Museum MF 1944, see Weinberg, S.S., "Terracotta sculpture at Corinth", *Hesperia* 26 (1957) 306-309, pls. 65-66, 74-75.

[2]See for examples, Moustaka, *OlF* 22 (1993)

[3]*E.g.* from Paestum, a seated man: Sestieri, P.C., "Terracotte Posidoniati" *BdA* (1963) 212-220.

figurines (those which were produced from the archetype) to produce second generation pieces, and this process may come to be repeated several times, terracottas made throughout a long period may display a style which seems earlier than that of contemporary sculpture. It is therefore difficult to assign dates to them and to make very close comparisons with other material, although a more accurate chronology is sometimes made possible by specific stylistic details which were added to the costs after moulding.[4]

1. ANATOMY

Hair-styles follow similar fashions to those described in marble and bronze sculpture. Most male heads have short hair (**TC21, TC23**) (pls. 164, 2-165, 1). Females may have thick straight strands, or short spiral locks over the forehead (**TC5, TC 7, TC10, TC 19**) (pls. 156, 2; 158, 160, 1) occasionally extended lower at the sides to cover the ears (**TC9**) (pl. 159); and, where the whole coiffure is rendered (mainly in pinakes, since in terracotta figurines hair is represented only on the forehead and the head is covered), long hair is either tied up at the neck (**TC18, TC 32, TC33**) (pl. 164, 1), or worn loose over the shoulders (**TC6**) (pl. 157). Some protomai and head-vases may have several rows of locks over the forehead, indicated in relief dots. The only parallel for both coiffure and rendering may be figures in late-sixth century vases usually attributed to the Pioneers.

The rendering of facial features in the protomai and reliefs recalls that noted in

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[4]See Nicholls, R.V. , "Type, group and series: a reconsideration of fundamentals" *BSA* 47 (1952) 226.

contemporary marbles and bronzes. The face is oval; the eyes are almond-shaped and slanting; and the upper eyelid is sometimes bevelled on small figurines; the cheek-bones are set high on the face; the mouth occasionally has a smile (**TC5, TC9, TC10**) (pls. 156, 2; 159; 160, 1); and the chin protrudes slightly.[5] From the early fifth century, the face is generally more rounded, the modelling more subtle, and the interrelation of the facial features better understood. Female proportions are those which have been described in other media: the hips are narrow, and the space between the breasts is wide. Although very fragmentary and clothed, the two large-scale statues (**TC1, TC24**), display an anatomical rendering which seems to be similar to that seen in contemporay marbles: the bare left foot of the statue found in the Acropolis (**TC1**) has the metarsal bones indicated, and long, slender, and bony toes parallel to each other - a treatment which may be noted in marble sculpture dated to last quarter of the sixth century.[6]

Yet, in the cheap mass-produced small-scale terracottas, no interest occurs in a more accurate and detailed rendering of anatomy which is marked in a coarse manner. In the few preserved examples of naked males in relief (**TC2, TC 22**) (pls. 163, 1b; 164, 2) or of figurinesin the round (**TC3**) (pl. 155, 2) only the pectorals are suggested; while the other muscles of the torso and upper and lower limbs are not indicated; and very often fingers are not defined on the hands. In the single known example of a naked female in terracotta from the Acropolis (**TC16**) (pl. 163, 1a), anatomical features added on the torso are more decorative

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[5]Type L4 for Croissant, dated to 520-510, *Protomés*, 278.

[6]Compare foot of **TC1** (pl. 155, 1) with that of the seated "Dionysos", **S56** (pl. 80).

than accurate, and more suitable for athletic males than for females.[7] In **TC16**, except for the addition of two small rounded breasts with a large space between them, the torso is marked with a developed musculature: the inferior boundary of the thorax is added; and abdominal divisions are rendered in parallel lines above the navel and on either side of the linea alba.

Painting is used to complete several anatomical details, and similar colours to those seen in marble statuary are applied. Hair is red, yellow or black; brows and iris are outlined in black; lips in red. A white slip was usually applied for female flesh before firing, while the male was left red or coloured pink. A few other features were also sometimes added in paint. Most seated figurines have the arm completed in paint rather than modelled. In some fine teracottas, eyelids and eyelashes may be painted; and in some head-vases, the locks over the forehead of female figures have two colours (a light background with dark dots in the middle) to suggest the snail shape, and the light-coloured iris may show slight dark points which probably represent the nuances of colours in the eye (**TC29**) (pl. 168).

Because of the modelling technique, it seems that clay work tends to be simpler in execution than contemporary stone sculpture. In the few existing dressed fragments of large-scale statues, there is little attempt to distinguish one garment from another and virtually no attempt to indicate anatomy beneath the drapery.[8] A general flattening of all anatomical parts may be also observed in terracotta figurines and reliefs, probably because these mass-

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[7]Similar features may be occasionally seen in naked females portrayed in vase-painting, see above 179-189.

[8]For this remark, see Bookidis, N., "Attic terracotta sculpture: Acropolis 30", *Studies in Athenian Architecture, Sculpture and Topography presented to H.A. Thompson, Hesperia, suppl.* 20 (Princeton 1982) 2.

produced terracottas use several times the same mould. For this reason, faces with a smooth modelling may be contemporary with those which display more contrasting volumes,[9] although it was noted that it is from the early fifth century that a fleshy rendering of the face becomes more common (**TC4, TC 8, TC11, TC14**) (pls. 156, 1; 160, 2; 161).[10] Croissant explains the appearance of fleshy faces and less contrasting profiles (nose more straight, chin less emphasised) as a result of an Ionian (mainly Klazomenian) influence on Attic art,[11] rather than an indication of progress towards anatomical knowledge. Writing about the style of **TC8**, he notes that "...il serait hasardeux d'y chercher un principe d'évolution linéaire et d'en déduire une chronologie: il s'agit tout au plus d'une tendance qui a dû se manifester de façon continue mais irrégulière dès le début du dernier quart du siècle".[12] The Ionian influence in Attic sculpture is widely acknowledged from the last quarter of the sixth century, and it may, combined with the modelling technique, have played a part in the development of a smooth rendering of anatomical features. This influence cannot, however, explain the combination of a more accurate interrelation of anatomical features with this smooth rendering which is developed in the art of the early fifth century since this is not seen in earlier Ionian sculpture.

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[9]See, for instance, the head-vase in Rome, Villa Giulia 50571: rounded face, smooth modelling, assigned to the Castellani Group (dated to *ca.* 520-510), Beazley, "Charinos", *JHS* 49 (1929) 47, 51. Croissant, "Collection P. Canellopoulos: vases plastiques", *BCH* 97 (1973) 213-216.

[10]And some other terracottas, not in the catalogue, such as Athens, Acropolis Museum 12660, 12783, which belong to the groups L11, L14a & b of Croissant (*Protomés*, 275, 278-280) who dates them to the first quarter of the fifth century (*Ibid.*, 294).

[11]*Ibid.*, 257, 292.

[12]*Ibid.*, 275.

Croissant himself recognises that it is dificult to define what regional influence may have led to the development of a fluid and less contrasted rendering of anatomical features,[13] while, according to the chronology he proposes, which relies on the coiffures rather than on the anatomical features,[14] a smooth rendering becomes common in a majority of protomai and head-vases dated to the early fifth century, and is, therefore, characteristic of a period, during which sculptors and bronze-makers generally acquired a better knowledge of human anatomy.

In the last decades of the sixth century, head-vases are introduced in Athens, and among them, some male and female negroes' heads (*e.g.* **TC26, TC 27, TC30, TC 38**) (pls. 166, 1; 167, 1). It was already noted in early scholarship that their racial characteristics were rendered with accuracy: short curly hair, broad nose, and large everted lips.[15] This rendering already appears in earlier representations of negroes in black-figure vases attributed to Exekias, which are dated to the third quarter of the sixth century (see pl. 166, 2a).[16] The rising interest in ethnic features on the part of Attic craftsmen coincides with the earliest known description of the distinctive negroid features in literature, attributed to Xenophanes of

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[13] *Ibid.*, 291: "on ne saurait exclure l'hypothèse d'une genèse essentiellement attique de ce type de visage à la face pleine et au profil peu contrasté". Before concluding to the Klazomenian influence: "... au contact de modéles qui doivent être d'abord de type clazoméniens, le schéma 'attico-corinthien' se serait arrondi et enrichi, le plan facial s'elargissant, s'arrondissant tandis que les contrastes du profil s'atténuaient au profit de la continuité graphique de l'ensemble".

[14] *Ibid.*, 293-294

[15] Beardsley, G.H., *The Negro in Greek and Roman Civilization. A Study of the Ethiopian Type* (Oxford 1929) 11-12, and for a list of archaeological material, see more recently, Snowden, F.M., *Blacks in Antiquity. Ethiopians in the Greco-Roman Experience* (Cambridge Mass. 1970) 22-19, note 18.

[16] Memnon's squire: London, British Museum 209, *ABV* 144, 8. 686. *Para* 60. *Add*^{2} 39. Side A: Philadelphia, University Museum MS 3442.

Kolophon (*fl. ca.* 530-500). The development of ethnic features in both vases and texts probably reflects a growing concern with different racial types and the anatomical features which distinguish them which was lacking from earlier texts such as the *Iliad*, the *Odyssey* and the poems of Hesiod.[17] It is also probably significant that Exekias, who was the only black-figure vase-painter known to endow human figures with a monumental, physical presence, and who was interested in suggesting human emotions, provides us with the most accurate early representation of negroid features in black-figure vase-painting.[18] The accurate rendering of ethnic characteristics points to the existence of models in Athens, or, at least to a direct knowledge of negroes on the part of Athenian potters rather than an indirect acquaintance through descriptions or imported representations. Yet, these vase-paintings and head-vases are not portraits:[19] racial features are combined with others which seem to be conventional. On two head-vases (**TC27, TC30**) (pl. 167, 1), deep wrinkles are scored on the forehead and at the corner of the eyes and lips.[20] Although they may have been added in order to suggest

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[17] References to Ethiopians but without describing their appearance, *e.g. Il.* 23.205, 207; *Od.* 1.22-24; Hes., 525. It is only from the fifth century that Greek writers become more generous in providing anthropological and geographical details concerning African Ethiopians and Aeschylus locates them in Africa, A. *P.* 808-809, see Snowden, *Before Colour Prejudice. The ancient View of Blacks* (London 1983) 103-107.

[18] Compare his rendering with that of a contempory vase-painter, such as the Swing Painter, Brussels, Musées Royaux d'Art et d'Histoire A130, *ABV* 308, 82, Snowden, *Blacks in Antiquity*, fig. 15, 45 (pl. 166, 2 a-b).

[19] It was proposed that they have more individualised features than other head-vases: Gorbunova, K.S., *Troudy Gossoudarstvemovo Ermitaja*, VII, 3 (Leningrad 1962) 30

[20]Boston, Museum of Fine Arts 00.332, Athens, Canellopoulos Collection: Croissant, *BCH* 97 (1973) 206, figs. 3-4; 209, fig. 6.

old age,[21] they also appear on the face of several black warriors on vases which combine these faces with a young muscular body,[22] they may be used to suggest the strong volume of the superciliary crests (part of the skull which gives volume to the region of the brows) which is a negroid feature. In fact, the introduction of the negroid type reflects both a growing interest in anatomy with distinctive racial features and an aesthetic attractiveness. As Beazley notes, "the black man gets in not because he has strong prophylactic properties, nor because he is more addicted to wine, or perfume, than the white man, nor because there were both perfumes and black men in Egypt, but because it seemed a crime not to make negroes when you had that magnificent black glaze".[23]

2. POSES

Numerous small clay figurines represent standing (**TC4, TC5**) (pls. 156, 1-2) or seated females (**TC1, TC2, TC 28**) (pls. 155, 1; 167, 2). The standing figures often have one arm flexed over the trunk which holds a flower or a fruit, while the other lies down by the side. The pose closely recalls that of the marble korai of which they seem to be an inexpensive version. They are dedicated in different sanctuaries and occasionally have

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[21]Beazley, *ARV*^{2} 1529, about the Boston vase: "The face is aged by engraved wrinkles".

[22]Exekias, Memnon's squire: London, British Museum 209, *ABV* 144, 8. 686. *Para* 60. *Add*^{2} 39 (see catalogue pl. 166, 2a). Boardman, *ABFV,* fig. 99. Epiktetos, Herakles fighting Busiris, the Egyptian priests: **V90,** pl. 228.

[23] Beazley, "Charinos: Attic vases in the form of human heads", *JHS* 49 (1929) 39.

attributes which may help identify them as different goddesses (**TC31**).[24] Some examples from the Acropolis may have one arm raised and flexed, separately added and now broken, probably in order to suggest a striding pose (**TC6**) (pl. 157). The seated figures have their feet placed together, and the arms, barely discernible, flexed in pronation on the knees. Because of their motionless pose and unarticulated body, the figurines found in the Athenian Acropolis have been sometimes considered as copies of an old, primitive statue, the olive-wood Athena Polias.[25] The appearance of the cult image of Athena Polias is a much debated subject,[26] and it is almost impossible to say whether there is a prototype for these numerous seated figurines or whether they developed independently.

In clay reliefs, figures may be shown in motion but they generally follow the Archaic conventions of representation, and appear either in a full profile view (**TC2, TC18, TC33**) (pl. 164, 1), or in a combination of frontal and profile views (**TC21, TC32**) (pl. 164, 2). For instance, Athena mounting on a chariot is represented with a frontal torso and head and legs in profile. She strides powerfully, her trunk slightly flexed forward, but her weight is put on the backwards leg, an unaturalistic rendering of the balance of a figure in motion (**TC17**) (pl. 163, 2). In some pinakes, however, figures are suggested in more lifelike poses. A relief plaque from the Acropolis shows Herakles kneeling in profile, having swung the lion over his head to

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[24]See Higgins, R.A, *Greek Terracottas* (London 1967) 72.

[25]Alroth, B., *Greek Gods and Figurines, Aspects of the anthropomorphic Dedications*, *Boreas* 18 (1989) 52-54.

[26]For bibliography, see Alroth, *Boreas* 18 (1989), 48, note 251.

lie upon its back on the ground (**TC21**) (pl. 164, 2).[27] In early fifth century pinakes, seated figures may have one leg flexed (**TC18**) (pl. 164, 1), the other extended as if they were about to stand up, a pose which appears earlier on the marble Athena attributed to Endoios and dated to the last quarter of the sixth century.[28]

The surviving fragments of large-scale statues in clay belong to figures at rest. One is a seated female, while the other is an equestrian figure. While the former is too badly preserved for any movement to be reconstructed, the latter (**TC24**) (pl. 165, 2), of which only the torso is preserved, adopts a similar stance to that of riders in marble. The head is turned slightly sideways and flexed; one arm is lies laterally; the other, now broken, was raised and probably extended.

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[27]See Thompson, D. B., "Mater caelaturae. Impressions from ancient metalwork", *Hesperia* 8 (1939) 287.

[28]**S16** (pl. 10).

CONCLUSION.

The rendering of anatomy described for terracotta figurines and reliefs differs significantly from that in marbles and bronzes. Although figurines, reliefs, and head vases show a development towards naturalism in the rendering of facial features similar to the other media, the anatomy of the rest of the body of the figures *en pied* does not become accurate and, when marked, it is suggested with flat volumes partly due to the technique of production which uses the same mould several times. Figurines adopt a limited number of poses, often at rest, they are shown standing or seated, or when in motion (usually in reliefs), in the conventional combination of frontal and profile views, or in a full profile view.

Experiments with a more acurate rendering of anatomy and lifelike poses follow a similar path in both marbles and bronzes, and reflect a close observation of the human body on the part of sculptors in stone and bronze-workers. In the last decades of the sixth century, anatomical features which were neglected in earlier sculpture are introduced in male statuary, while a decorative and accurate rendering may be combined in the same statue. Gradually the geometric decorative shapes disappear; anatomical features are outlined in irregular forms closer to those seen in nature; and, from the early fifth century, the exhaustive treatment of anatomy, in which muscles and sinews are carved in independent detailed patterns is replaced by a treatment in which musculature is simplified and interrelated. This rendering moves away from the conventional Archaic representation which builds up the human body in independent parts related without anatomical accuracy (head, torso, limbs; and anatomical features in close patterns); and reflects a better understanding of the body as a whole.

It has been noted that when sculptors progressively improve the relation between anatomical features, they use, both in marbles and bronzes, a smooth rendering which minimizes the anatomical boundaries and increases the interrelation between the different muscles through a subtle play of light and shadow. While this soft and fluid rendering may be occasionally seen in earlier statues (from the last quarter of the sixth century in Athens) it is not employed in these sculptures - in marble, bronze or terracotta - to portray anatomical features more accurately but is a stylistic hallmark. This smooth rendering is common in late-sixth century bronzes and terracottas and is probably due to the technique of modelling, but its development in some contemporary marbles from Attica was seen as the result of an Ionian influence in Attic sculpture. Yet, its introduction in marbles coincides with the growing importance of bronze statuary and may also reflect the influence of this technique, in which the sculptor shapes the original clay or wax model by the pressure of his fingers and addition of soft material.[1] Moreover, the combination of a smooth carving with a more accurate rendering of anatomy is developed only from the early fifth century, and appears in statues which are shown in lifelike poses or even in complex action poses (mainly in pedimental sculpture). According to several scholars, the experiments with more lively poses in marbles also require a model, presumably in clay or wax,[2] since statues cannot be carved directly from

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[1]In fact, the fleshy style of Ionian sculpture was mainly developed in Samos (see *e.g.* Samos, Vathy Museum, no inventory number, Vathy Museum 77, Freyer-Schauenberg, B., *Bildwerke der archaischen Zeit und des strengen Stils, Samos XI* (Bonn 1974), 42-43, no. 57, 207-210, no 139, pls. 42-43 and 86-87), and may have also resulted from a bronze-casting tradition since the earliest bronze-makers praised for their art and technical skills by ancient texts were from this island (Theodoros of Samos introduced a new technique of bronze casting: Paus. 8.14.8).

[2]Full-size models, and ancient sources which mention preliminary models are known only from the fourth century, Palagia, O., "Les techniques de la sculpture grecque sur marbre",

the four main sides of the block as they were throughout the Archaic period.[3] The model was translated into the corresponding stone with a rudimentary pointing system by which specific prominent areas were selected and transferred to the uncarved block; they then served as main references points (a method which measured off details from a triangulation of points on the clay).[4] When a smooth rendering of anatomical features became widespread in marble, it probably resulted from the growing use of clay models on the part of sculptors of marbles, who further developed this rendering in order to enhance the interrelation of the anatomical features.

Parallel to the development of a more accurate rendering of anatomy, sculptors are interested in portraying lifelike poses and a naturalistic representation of the balance of figures at rest. Throughout this chapter, it was shown that the rendering of both anatomy and poses is related: the representation of lifelike poses depends on the growing knowledge of human anatomy, and on a close observation of the varying shapes of flexed and extended muscles which are gradually suggested in sculpture. Although experiments with the representation of the body in motion were carried out from the last quarter of the sixth century, it is only when

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Marbres Hélléniques. De la sculpture au Chef-d'Oeuvre,(Exhibition Catalogue) (Brussels 1987) 78, 79 note 20. For a model scaled to a fraction of the finished work's desired dimensions, Stewart, *Sculpture*, 35, and for the hypothesis of not very detailed clay models made for early Classical marbles, Boardman, *GSCP*, 14.

[3]About the advanced state of cutting the statue in the quarry before the export, see Adam, *Technique*, 7. Examples of unfinished kouroi from the quarry of Apollona at Naxos: Athens, National Museum 14, Blümel, K., *Greek Sculptors at Work* (London 1955) pls. 5, 6, and a kouros left on the path from the quarries, Boardman, *GSAP*, fig. 55.

[4]Ridgway, *Muses at Work*, 109. Measurements may be reckoned with a plumb-line as shown on a Hellenistic Greek gem produced in central Italy, New York, Metropolitan Museum of Art 81. 6. 26 (see Richter, *Catalogue* (1956) no 223).

sculptors understand the interrelation of the anatomical features and conceived the body as a whole - from around the early fifth century - that significant progress was made towards naturalism in bodily poses.

Yet, the development of a more accurate rendering of anatomical features is not paralleled with a growing understanding of the rendering of balance in a specific type of free-standing marbles: the kouros and kore. In a statue, such as Aristodikos, the sculptor carved anatomy with care and accurate features, but was not interested in suggesting ponderation and showed the body in a rigid pose. This lack of interest in muscular and bodily motion is explained neither by the carving technique and the medium used since we know of contemporary and earlier free-standing figures in marble portrayed in action, nor by a lack of anatomical knowledge on the part of the sculptor. It is the function of the statue which probably limits the experiments with the rendering of motion and ponderation. A kouros and a kore commemorate the deceased and function as a sema and mnema, or are dedicated to a divinity they have to please;[5] they, therefore, have to reflect the aristocratic ideal of a man or a woman. They are generic and timeless types, and cannot portray the *phenomenon*, to which belongs the changing form of a body as it moves in space; the kouros' type, common until the turn of the sixth century, recalls the square-shaped stone from which the statue is carved. As soon as the political regime changes in Attica, funerary sculpture which commemorates the aristocratic families tends to disppear,[6] and the kouros type gives place in Attic sanctuaries to

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[5] For a summary of the kouroi and korai's function with possible meaning and further bibliography, Stewart, *Sculpture*, 109-110; D'Onofrio, A.M, "Aspetti e problemi del monumento funerario attico arcaico", *AnnOrNap* 10 (1988) 88-91.

[6] The lack of Attic funerary sculpture dating from the end of the sixth century is often explained by a passage in Cicero which mentions an anti-sumptuary law for funerary

free-standing statues which may display either motion or ponderation when shown at rest.

At about the same time as the growing interest in a more accurate rendering of anatomy and bodily poses, there are occasional attempts in representing faces which do not reproduce a common type and emotion. Although most Archaic figures were impassive, "grief, desire, fear, and happiness being expressed ... through conventional gestures that serve as informing signs",[7] emotion is rendered in some faces of statues dating from the last quarter of the sixth century. In these early experiments, it is, however, suggested according to conventions similar to those seen on votive masks, or is limited to the grinning expression given to early monsters. It was noted that sculptors simplify the range of human feelings to some expressive models because of their lack of anatomical knowledge reflected in the contemporary rendering of anatomy. In the last quarter of the sixth century, sculptors did not interrelate the anatomical features yet, and, although interested in emotion, they, therefore, suggest it without understanding how the facial muscles interrelate and move when they express feelings. When the changing shape of the muscles in motion is suggested and an accurate rendering of anatomy is further developed in sculpture, sculptors who sought for facial emotion, suggest it in a naturalistic manner which is not limited to conventional means.[8]

The development of distinctive facial features during the same period also reflects a

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monuments, *De Leg.* 2.26.64, see Harrison, "Archaic gravestones from the Athenian Agora", *Hesperia* 25 (1956) 44.

[7]Hurwit, *The Art and Culture*, 25.

[8] See the nuances of feelings indicated on the faces of the figures from the east pediment of the Temple of Aphaia, and that in Olympia, compare the face of a dying warrior from west pediment of Aphaia, (Stewart, *Sculpture*, vol. 2, fig. 248) with that of a Lapiths (Q) and Deidaneira (H) from the west pediment in Olympia, Ashmole B., Yalouris, N., *Olympia, The Sculptures of the Temple of Zeus* (London 1967) figs. 112-113 (H), fig. 90 (Q).

growing interest in naturalism, but, the sculptors, contrary to their experiments with facial expression in which they gradually mirror life, do not progressively render anatomical features which build up "real portraits". Although, according to literary sources, there is a growing number of paintings which represent famous men after the Persian Wars,[9] material evidence shows that sculptors were not interested in carving real portraits. The rising desire to record a wider range of natural appearances did not lead Greek art to realism. The interest in a more naturalistic rendering of the human body which is reflected in the development of a more accurate rendering of anatomy and motion is limited. Muscles, outlined in accurate shapes, are those seen on well-trained male bodies in the flush of youth, and aged or fat bodies are extremely rare. This interest of sculptors in theoretical proportions and symmetry is already reported by ancient commentaries on Greek statuary referring to the middle of the sixth to the middle of the fifth century (see **T15, T17, T18**); and both tendencies, to seek for an ideal form - "which excludes the atypical, gives a manageable shape to the endless complexity and irregularity of natural forms"[10] - and to suggest a naturalistic anatomical representation (developed from the late sixth century), underlie fifth-century sculpture, which "showed the artist working towards a satisfactory reconciliation of these apparently contradictory aims - an art which mirrors life, that expresses an ideal in human images, that acknowledges the dominance of pattern and proportion".[11]

Although experiments with a more accurate rendering of anatomy and lifelike poses are

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[9]Paus. 1.15.3; Ael., *NA* 8.38.

[10]Hurwit, *The Art and Culture*, 18.

[11]Boardman, *GSCP*, 21.

carried out at about the same time in marble and bronze, and follow a similar development towards naturalism, bronzes offer more possibilities than marbles in the rendering of some anatomical details, and a greater freedom in portraying figures in action. Engraved strands and added locks of hair, along with inserted eyelashes increase the naturalistic appearance of large-scale bronzes, and their rendering occasionally influenced that seen in marble: from the early fifth century, some marbles have individually cut strands, bronze or marble locks attached separately, and upper and lower eyelids with thick borders probably in order to add eyelashes in paint. Complex action poses are introduced in athletic bronze statuary, while the experimentation with unstable poses is more limited in contemporary free-standing marbles since there is always a need for struts and props.

Ancient sources also attribute the introduction of a more naturalistic rendering of hair patterns and early experiments with motion to bronze statuary.[12] They mention Pythagoras of Rhegion (**T20**), whose main production was in bronze and who was the pupil of a bronze-worker,[13] as the sculptor who developed a more accurate rendering of hair and introduced the ῥυθμός in statuary (**T16**). They also credit the same man with the earliest depiction of blood vessels. In the surviving material, the earliest known examples of blood-vessels occur in marbles dating from the first quarter of the fifth century, while they appear only in surviving bronzes dating from the second quarter of the fifth century:[14] a vein runs across the main

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[12]**T16, T20.**

[13]Klearchos of Rhegion: Paus. 3.17.6

[14] The few surviving large-scale bronzes dating from the late sixth or early fifth century did not have blood-vessels modelled on their body: Zeus from Ugento, Taranto, Museo Archeologico Nazionale 12137, Apollo from Piraeus, Piraeus, Archaeological Museum, no inventory number (**B39**, pl. 154), and Poseidon from Livadhostro, Athens, National Museum

muscle of the calf (gastrocnemius) on a fragmentary leg;[15] blood vessels are also suggested on the upper and lower limbs, of the statue A from Riace, dated to the 460s;[16] and Niketas Choniates describes veins which stood out distinctly on the neck of a large-scale bronze in Konstantinople which was identified with the Athena Promachos of Pheidias.[17] Despite the lack of evidence of blood vessels in early fifth century bronzes, a more naturalistic rendering of details, such as veins, seems easier in bronze statuary. The difference between anatomical details rendered in marbles and bronzes is illustrated by the comparison between marble and bronze copies of the head of a later bronze, the Doryphoros of Polykleitos. The fine engraving of the hair and eyebrows seen on the bronze replica is not achieved in any of the marble copies,[18] and a later text specifically points out that the apprentices of painters and bronze workers exercise the *akribeia* of their art in the representation of veins, the down of the cheeks

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11761 (pl. 298).

[15]London, British Museum GR 1886.3-24.1 (fragment of a leg and drapery), Williams, 'Knight Rider. The Piot bronze' *AA* (1989) 533.

[16]Reggio di Calabria, Museo Nazionale, see *Due bronzi di Riace. Rinvenimento, restauro, analisi ed ipotesi di interpretazione*, *BdA ser. spec. 3*, vol. 2 (1984) pls. 25. 26, 28, 31, 33. Statue B displays a vein on the stomach but has been considered as Late Classical, see for its date and the representation of the vein, Ridgway B.S., "The Riace bronzes. A minority viewpoint" *BdA, ser. spec. 3*, vol. 2 (1984) 37, note 25.

[17]Niketas Choniates, *Isaac. Ang. et Alex.*, E 738B, See Stuart-Jones, H., *Select Passages from ancient Writers Illustrative of the History of Greek Sculpture*[2] (Chicago 1966) 78-79. If the identification with the Athena Promachos of Pheidias is accepted, this statue would be the earliest known example of a female figure which displays veins in the Classical period.

[18]For the rendering of veins and other anatomical details on marble copies of Classical works (mainly the Doryphoros), see Hallett, C.H., "Kopienkrietik and the works of Polykleitos", *Polykleitos*, 141-151; and for the comparison between a bronze and marble copy, 159, note 62. Bronze copy of the Doryphoros: Herm of Apollonios from Herculaneum, Naples, Museo Archeologico Nazionale, see Hallett, *ibid.*, 154, figs. 8.48, 8.50-51.

and other such minutiae.[19] It seems, therefore, probable that veins were added at about the same time in bronzes and marbles since their rendering in the former medium seems easier than in the latter, but also because the representation of veins results from a close observation of the human body noted for both marble and bronze sculptors.

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[19] DH, *Comp* 25, quoted by Hallett, *Ibid.*

V. VASE-PAINTING

As in sculpture, in vase-painting the rendering of anatomy has been an important element in defining the style of individual artists. Beazley, who organised Athenian figured vases of the sixth to the fourth centuries into painters and groups,[1] considered human anatomy the single most important aspect of the figure decoration in the recognition of an individual vase-painter's style;[2] and, after him, a few scholars have regularly studied anatomy when considering a painter's style.[3] I here accept the presentation of Attic vase-painting in terms of individual "artists" since it is neither my concern to deal with the style of individual painters, nor to discuss the criticism of Beazley's approach.[4] Attributions are regarded as a convention upon which the study can rely on as a starting point. The choice of vases is made according to

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[1]See *ABV*, *ARV*^{2}, *Para*, *Add*^{2}.

[2]Kurtz, D.C., "Beazley and the connoisseurship of Greek Vases" *GV J Paul Getty M* 2 (1985) 247.

[3]*E.g.* Kurtz, D.C., *The Berlin Painter* (Oxford 1983); Buitron-Oliver, D., *Douris: a MasterPainter of Athenian Red-figure Vases* (Frankfort am Mainz 1993); von Bothmer, D., "Euphronios an Attic vase-painter's view of the human body", *Goulandris Foundation. Dialexeis* (1986-1989) (Athens 1989) 26-42.

[4]Two main criticisms were made to it: the importance given to vase-painting as an art (see Robertson, "Beazley and Attic vase-painting", *Beazley and Oxford: lectures delivered in Wolfson College, Oxford 28 June 1985*, ed. Kurtz, D.C. (Oxford 1985) 19-30; *AVPCA*, 2-6), and the validity of the method used to define the personal style (*e.g.* Bruneau, Ph., "Situation méthodologique de l'histoire de l'art antique" *AntCl* 44 (1975) 448-451). For a summary of the discussion and its bibliography, Sparkes, B.A., *The Red and the Black: studies in Greek Pottery* (London & New York 1996) 91-102.

the figured-decoration, and it is not limited to a workshop or a vase-painter's production, while unattributed vases are also included in the catalogue.

Although it is generally acknowledged that a growing interest in a more naturalistic rendering of the human figure occurs with the introduction of the red-figure technique, previous studies have not examined extensively the represention of the human body in contemporary vase-painting but usually limited themselves to the production of a few vase-painters.[5] This chapter aims to understand the extent to which a more accurate rendering of anatomy and lifelike poses is developed in both black- and red-figure vases, while mention is occasionally made of other techniques experimented during this period in the potters' quarter, such as white-ground and coral red.

As in marbles, bronzes and terracottas, the discussion is divided into two sections: PART 1 studies the rendering of anatomy, PART 2, the poses of the human figure. In conclusion, the differences which may occur in the rendering of the human figure between black- and red-figure techniques and the influences of one on the other are pointed out; while the possible sources of inspiration of vase-painters for the development of a more accurate rendering of anatomy and new poses are discussed.

For the absolute dating of vases, scholars have compared them with sculpture for

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[5]*E.g.* Beazley, J.D., "A Greek realist", *Greek Vases: Lectures by J.D. Beazley*, ed. Kurtz, D.C. (Oxford 1989) 78-84; Williams, "The drawing of the human body on early red-figure vases", *New Perspectives in early Greek Art,* ed. Buitron-Oliver, D. (Hannover1991) 285-303; Kurtz, "Pioneering anatomical realism", *Euphronios. Atti del Seminario Internazionale di Studi. Arezzo 27-28 Maggio 1990*, eds. Iozzo, M., Nicosia, F., Zamarchi Grassi, P. (Florence 1992) 29-37.

which chronology has been established,[6] and date the introduction of the red-figure technique to *ca.* 525 by comparison of the style of early red-figure vase-painting with that of the marbles of the Siphnian Treasury. The other absolute dates available for Attic vases between *ca.* 525-480 were recently listed and confirmed by Williams.[7] He mentions the battle of Marathon (490) and the Persian Sack of the Akropolis (480). A tumulus in Marathon, usually identified with that erected after the famous battle and mentioned by Pausanias,[8] allows a *terminus ante quem* for the vases and sherds discovered in it (a fragmentary kylix attributed to Onesimos and a group of late black-figure lekythoi),[9] and for the vases stylistically close to them. From the excavations in the Athenian Akropolis, a group of red-figure sherds was found in a place named the "Dreieck". The area is bounded on one side by the early "Pelasgian" or Mycenaean retaining wall, and on the others by a right-angled corner of a later ashlar terrace-wall. The association of the latter with the traces of burning in the foundations of the Parthenon, the presence of burnt unfinished drums of columns, and the widespread burning of the pottery suggests that it is a part of the terracing and cleaning up of the Akropolis after the Sack of 480. The latest sherds of the deposit which are not burnt date this clear-up to the decade 480-470 or thereafter, while the burnt sherds must dated before the Persian Sack, this material, therefore, provides a *terminus ante quem* for the vases and sherds which are

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[6] Langlotz was among the first to compare both media, see *ZSVP*; Rolley, *Sculpture*, 164-165.

[7] "Refiguring Attic red-figure. A review article", *RA* (1996) 245-250.

[8] 1.32.3

[9] The Marathon material was published in the *CVA* Athens 1; the red-figure kylix was attributed to Onesimos by Williams, "Onesimos and the Getty Iliupersis", *GV JPaul Getty M* 5 (1991) 41-64.

decorated in style close to theirs.

1. ANATOMY

In black-figure, hair, forehead locks, and beards are enlivened with applied colours (matte white, opaque red) and incisions. Strands outlined in many fine incised lines are rare, and this rendering is generally considered as the hallmark of some vase-painters. It may be seen on vases dated to the third quarter of the sixth century, and attributed to Exekias,[10] and on vases attributed to the Lysippides Painter and his circle (**V79, V128**) (pls. 197; 261, 1).[11]

It is with the introduction of red-figure that further possibilities and details are developed in the rendering of hair. Although painters, who may have worked in both black- and red-figure technique, carry on, for a while, the black-figure usage of applying colours and incisions to enliven hair,[12] relief dots are occasionally added on the forehead and the nape of

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[10]In vases attributed to Exekias: *e.g.*, Zeus: A, Orvieto, Museo Civico, Coll. Faina 78, *ABV* 144,9; *Para* 60; *Add*^{2} 39; Ajax: A, Boulogne, Musée Communal 558, *ABV* 145,18; *Para* 60; *Add*^{2} 40; Technau, W.L., *Exekias* (Bilder griechischen Vasen 9) (Leipsig 1936), no.1, pl. 12,b; nr. 9, pl. 24, b.

[11]Compare the loose hair carefully incised strand by strand of the dead Achilles (**V197**) with that suggested with only a few incisions of the dead Amazon (**V82**) (pl. 205) which gives a vague outline of the overall mass of hair.

[12] In his earliest amphorae (**V151, V157**) (pl. 277, 2), the Andokides Painter marks black hair with stippling and added red, and suggests interlocking spirals in relief on the head of Herakles (**V79**) (pl. 194), which probably follow a black-figure prototype of independently incised locks of hair such as that seen in Basle, Private Collection (Lysippides Painter), see Cohen, B., *Attic Bilingual Vases and their Painters* (New York & London 1978), 28, pl. 8. 2. About the question whether the Lysippides and the Andokides Painter were the same man or two, extensive bibliography in Robertson, *AVPCA*, 10 notes 11-13.

the neck to represent short locks;[13] and a fuller use of dilute glaze is made in order to suggest different colours and texture of hair. Antaios on (**V188**) (pl. 283, 2) has straight, rather uncombed reddish-brown hair and beard; and light-coloured hair may be also seen on some figures on large-scale vases, such as craters and amphorae. On these, the painter has first covered the skull with an undercoat of dilute glaze over which he has drawn strands in heavier and darker lines (**V138, V152, V198**) (pls. 269, 1; 276, 1; 286, 1).[14] Although this rendering uses the possibilities offered by the red-figure technique, it still recalls the diligence in detailing strands of hair described for earlier black-figure vase-painters, and probably carries on an Archaic taste for details.[15] Hair may be also rendered in simple dots of dilute glaze, sometimes on a lighter wash which suggest either a shaven, or merely a greying aspect.[16] The use of dilute glaze becomes widespread with the next generation of red-figure painters, and is applied either in washes, or in strands. Light-coloured hair is no longer limited to heroes, gods, and a very few young athletes and symposiasts, but is extended to other figures.[17] It is seen on large vases, but also on small friezes decorating the neck of large vases,[18] and cups.[19]

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[13]*E.g.* (**V79**) (pl. 194), frequently seen on vases attributed to the Pioneers (**V153, V188**) (pl. 283, 1), and early fifth century vases such as (**V8**).

[14]von Bothmer, *Dialexeis* (1986-1989) 34-35.

[15] von Bothmer has compared the hair of a head in black-figure (**V197**) with that of Sarpedon in red-figure (**V152**), "The subject matter of Euphronios", *Euphronios peintre. Actes de la journée d'étude organisée par l'Ecole du Louvre et le Département des Antiquités grecques, étrusques et romaines du Musée du Louvre. 10 Octobre 1990,* ed. Denoyelle, M., (Paris 1992) 15-16.

[16] This rendering is associated with old men, such as Priam (**V141**).

[17]*E.g.* satyrs: **V26** (pls. 179, 1), child: **V42** (pl. 184, 1) maenads: **V132** (pl. 265,2), Aithra:**V141**.

[18]*E.g.*: neck of a volute-crater attributed to the Kleophrades Painter, (**V109**) (pl. 251, 2)

In vase-painting hair-styles are similar to those described in sculpture: there is a growing fashion of short hair for males, and chignons for both male and female figures. Except for white hair which generally identify aged figures,[20] the length and colour are not age or social attributes of the figures depicted on vases.[21] Long and short hair-styles may be worn by both young and mature men, while fair colour is not limited to heroes and gods but also occurs on revellers and barbarians. Hair colour may also vary on a figure which represents the same individual on two different vases, and who is identified in both by an inscription.[22] Smikros appears once with light-coloured hair on a crater attributed to Euphronios (**V138**) (pl. 239), while he is dark-haired on a stamnos in Brussels (**V51**) (pl. 186, 1).[23] In fact, the growing number of hair-styles and colours increases the decorative effect of the figures, and light hair

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see, Frel, J., "The Kleophrades Painter in Malibu", *JPaul Getty M J* 4 (1977) 65-67.

[19] *E.g.*, The Brygos Painter, Klytaimnestra: I, Berlin Staatliche Museen (former East) 2301, see Boardman, J., *Athenian Red Figure Vases. The Archaic Period*[2] (London 1988) fig 250, *ARV*[2] 378, 129; *Add*[2] 226, komasts: A-B, London, British Museum E 68, see Boardman, *Ibid.*, fig. 253. *ARV*[2] 371,24, 1649; *Para* 365; 367; *Add*[2] 225.

[20]Aithra:**V114**, Priam: **V191** (pl. 285), **V233** (pl. 294, 2). Nereus: B, London, British Museum E 73, *ARV*[2] 192, 106; *Para* 341; *Add*[2] 189; and old man: A, Würzburg, Martin von Wagner Museum 508, *ARV*[2] 181,1; *Para* 340; *Add*[2] 186

[21] See the discussion of hair-styles in sculpture 74-81; for vase-painting, see Dover, J.K., *Greek Homosexuality* (London 1978) 78. For instance, young boys may have both short and shoulder length hair, *e.g.* **V42, V94** (pls. 184, 1; 234, 2).

[22]Although name inscriptions do not always identify figures on vases, on (**V51, V138**), the placing of the name starting from the head of the subject probably shows that it refers to the figure, see discussion, Boardman, *J.*, "Kaloi and other names on Euphronios' vases, *Euphronios. Atti* (1992) 47.

[23]Named by an inscripition. "Neither will be a true portrait. Euphronios is an affectionately handsome rendering; Smikros shows himself with dark hair and a rather snub, sensitive profile... The disparate views comfirm the suspicion that an archaic Greek felt his simple presence and name to be ample identification, that differences of individuals through portrait techniques did not strike him as important." Vermeule, E., "Fragments of a symposion

with an underlying wash may be used to single figures out. In red-figure dating from the last quarter of the sixth century, this technique remains rare and is generally applied to figures which are also distinguished by their size, central position, detailed anatomy, and foreshortened poses,[24] or, in the case of a few, by their expressive facial features (Sarpedon:**V152,** Antaios:**V188**) (pls. 276, 1; 283, 2).

Hair-style may, however, occasionally reflect a specific rite, or refer to the state of the figure. Dots on a dilute glaze are often seen as a representation of the stubble on a shaven head and chin. This is considered as a ritual cutting which expresses lament not only for death, but also for the departure to war and the fall of cities, a ritual usually limited to old men.[25] In some vases, painters may emphasize the barbaric identity and the defeated state of the opponents of Greek heroes by portraying them with uncombed hair, which contrast with the neatly combed hair of the hero.[26]

Black-figure vase-painters outline few anatomical features which they suggest in decorative patterns rather than in accurate shapes. On the head, the ear is outlined in a rounded pattern extended below in a short tip which does not render a natural shape (**V79, V83**) (pls. 197; 210); on the face, usually in profile, the eye, drawn in a frontal view, is rounded without lacrymal caruncle for males and almond-shaped for females (**V82**) (pl. 206); and, in some examples, the mouth is suggested with large lines which do not outline the lips with accuracy

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by Euphronios", *AntK* 8 (1965) 38.

[24]Athlete: **V20,** symposiast: **V138** (pl. 269, 2), Kyknos:**V153** (pl. 276, 2).

[25]Williams, "An oinochoe in the British Museum and the Brygos Painter's work on a white ground", *JbBerlMus* 24 (1982) 17-40.

[26] *E.g.* Antaios (**V188**) (pl. 283, 2).

(**V83**) (pl. 210). The closed eyes of some dying figures have the eyelids drawn in zig-zag lines which reflect a decorative preference from the part of the painter rather than a close observation of the anatomical feature (**V81, V82**) (pls. 202; 205). The male chest is commonly indicated by a flat, rounded 'U', and the musculature of the stomach is cursorily and irregularly marked, often in small parallel strokes.[27] Incised arcs and curves are sometimes added on the upper and lower limbs. One or two arcs on the upper arm indicate biceps and triceps, and a single curve on the forearm the brachioradialis;[28] an arc on the thigh indicates vastus medialis or lateralis, a curve on the knee the kneecap, and an arc on the lower leg the calf (gatrocnemius).[29] In some figures, incised patterns which do not reproduce existing muscles, are added on upper and lower limbs: on the dorsal aspect of the feet of (**V79**) (pl. 200), on the dorsum of the hand of the dead Amazon (**V82**) (pl. 205), on the shoulders and thighs of some figures of the Leagros Group. They may be either decorative "fillings", or attempts to suggest the volume of a muscle - that of the shoulder and thigh on the Leagros Group, or that of a subcutaneous bone (of the feet, **V79**) (pl. 200). The exposed flesh of female figures is covered with a white slip, and a few incisions suggest anatomical features in patterns similar to those seen on men, which are limited to the upper and lower limbs since females are usually clothed,

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[27]*E.g.* Exekias, Ajax: Boulogne, Musée Communal 558; *ARV*^{2} 145,18; *Para* 60; *Add*^{2} 40; Technau, *Exekias*, pl. 24; **V11, V18, V32, V150** (pls. 150; 175).

[28]*E.g.* The Amasis Painter, Achilles arming: Boston, Museum of Fine Arts 01.80.27.; *ABV* 157,27; 687; *Para* 63; *Add*^{2} 44; Boardman, *Athenian Black Figure Vases*^{2} (London 1988) fig. 86; **V81, V82, V83** (pls. 202; 206; 210).

[29]*E.g.* Exekias, Wrestlers: Karlsruhe, Badisches Landsmuseum 65.45, *Para* 61,8*bis*; *Add*^{2} 39; Boardman, *ABFV*, fig. 106; **V81, V82, V83, V106** (pls. 203; 204; 208; 213; 248)

and the anatomy of the rest of the body is concealed.[30]

Although, from the last decade of the sixth century, a few black-figure vase-painters represent anatomical features, neglected until this period, probably in order to compete with the experiments carried out on contemporary red-figure vases, they do not achieve a more accurate rendering of anatomy.[31] Muscles, outlined in the "wrong" places,[32] and with inaccurate shapes, [33] do not reflect a better knowledge of human anatomy. In fact, along with the lack of interest in a more accurate rendering of anatomy from the part of the vase-painter, the technique used may also probably explain why there are only few anatomical features outlined in black-figure vases. Silhouettes are rendered in solid black, and the incised interior details are made with a pointed instrument: they are slow, controlled lines of even depth which do not allow a great variety and restrict the painter's ability in the rendering of inner details.

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[30]*E.g.* Exekias, woman mourning: Berlin, Staatliche Museen 4604; *ABV* 78,13; Boardman, *ABFV*, fig. 105,1-2; and on vases of the last quarter of the sixth century, the Lysippides Painter, Amazons: (**V150**) (pl. 274, 2), the Leagros Group, dead Amazon: (**V82**) (pls. 205-206).

[31] See Boardman, *ABFV*, 112-113. and Moon, W.G., "Some new and little known vases by the Rycroft and Priam Painters", *GV J Paul Getty M* 2 (1985) 40-70.

[32] *E.g.* The inferior border of pectorals is placed too low on the torso and a curve is added on their surface which does not correspond to an anatomical feature (see the athletes of **V146**) (pl. 273, 2). On **V222** (pl 292, 1), the costal margin is not suggested on the torso of Herakles and the abdominal divisions start below the pectorals. On **V206** (pl. 287, 2) the abdominal divisions are extended below the navel, in an area where they are not normally visible in a life model.

[33]Long horizontal clavicles of the figures on **V146** (pl. 273, 2); ovoid shape of the inferior border of the abdomen on Kyknos (**V206**) (pl. 287, 2); the abdominal divisions are abnormally large, the flank very narrow on the torso of Herakles (**V222**) (pl. 292, 1); the lower limbs may be ill-proportioned when shown in a frontal view (*e.g.* Herakles: **V127** (pl. 260).

The possibilities offered by the red-figure technique, with brush and relief line,[34] in order to experiment with a more accurate rendering of anatomy were not explored initially. In very early red-figure vases, muscles are rare or drawn in patterns similar to those seen in black-figure;[35] and in some bilingual vases, the body on the black-figure side may display more anatomical details than those on the red-figure (*e.g.* **V176**) (pl. 281, 1).[36] Additionally, until around the turn of the century, inaccurate features and a propensity for a symmetrical and decorative treatment of musculature may be seen, even in vases attributed to the "Pioneers", who are generally acknowledged "to have a deepened interest in the human frame and in human movement".[37] On the head in profile, the ears are drawn in an ovoid shape extended in a tip which represents the lobe, and have the tragus only occasionally outlined on some large figures; the eyes are shown in a frontal view without a lacrymal canal added, while the curve of the chin stops when it meets the neck and does not mark the contour of the jaw. On the male trunk, the abdominal divisions may be suggested in ovals enclosed in a circular line that forms

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[34]About the technique of relief line: Robertson, *AVPCA* 16; It is drawn with a syringe according to Noble, J.V., *The Technique of painted Attic Pottery*[2] (London 1988), 56-58; with a hair, Seiterle, G., "Die Zeichentechnik in der rotfigurigen Vasenmalerei", *AntWelt* (1976) 7; and Hemelrijk, J.M., "A close look at the potter", *Looking at Greek Vases,* eds. Rasmussen, T., Spivey, N. (Cambridge 1992) 239-242.

[35]*E.g.* (**V99, V151, V179, V275**) (pl. 236, 2; 294). For the style of some very early eye-cups in red-figure, see Cohen, *Bilingual Vases,* 254-262; and "Oddities of very early red-figure" *GV JPaul Getty M* 4 (1989) 73-82; Mertens, J., "The Amasis Painter: artist and tradition", *Papers on the Amasis Painter and his World* (Malibu 1987) 168-183. For the style of other very early red-figure vases see Cohen, *Bilingual Vases,* 105-160; for the Andokides painter, von Bothmer, "Andokides the potter and the Andokides Painter", *BMetrMus* 24 (1965-66) 201-212 (on the specific style of **V151**); for Psiax, see Mertens, "Some new vases by Psiax", *AntK* 22 (1979) 30-32.

[36]Villard, F., "Euphronios, les Pionniers et l'esprit de progrès", *Euphronios. Peintre à Athénes au Vie siècle avant J.-C.* (Paris 1990), 25.

the lateral boundaries of the stomach.[38] In this rendering, the semicircular swelling of the thoracic arch, the strong vertical line which divides the stomach medially (linea alba) are often omitted;[39] while the number of aponeurotic intersections is larger than that which appears in nature.[40] Upper and lower limbs may have their anatomy drawn in conventional patterns similar to those seen in black-figure; the medial and lateral aspects of the muscles not distinguished since painters carry on the archaic convention of showing the "most typical" shape regardless of the view in which the muscle is seen.[41] Anatomical features may be also depicted in the wrong places: for example, the hamstrings are drawn on the thigh, although they should appear at the bend of the knee.[42]

Nonetheless, a more accurate rendering of anatomy is developed in late sixth century vase-painting, and muscles, previously only occasionally drawn, are regularly outlined on

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[37] Beazley, *Attic Red-figured Vases in American Museums* (Rome 1967), 27; *ARV*^{2}, 13.

[38]The Andokides Painter (**V151**) (pl. 175), Psiax (**V62**) (pl. 188, 1), the Goluchow Painter (**V235, V236**) (pl. 297, 1).

[39](**V62, V235, V236**) (pls. 188, 1; 297, 1).

[40] Paris, Musée du Louvre G48, *ARV*^{2} 23,1; 1620; *Para* 323; *Add*^{2} 154; *Euphronios* (1990) no 62, 245-247; For this rendering by Euphronios on (**V154**) (pl. 277, 1), see Villard, *Euphronios* (1990), 31, who relates it with that of Psiax and Phintias. The Getty cup might illustrate the influence of the style of the late Psiax on that of the young Euphronios: Robertson, "Euphronios at the Getty" *JPaul Getty M J* 9 (1981) 24-26; Williams, *New Perspectives*, 287; von Bothmer, *Dialexeis* (1986-1990) 27-28.

[41] *E.g.* Euphronios on (**V2, V139, V152**) (pls. 170, 1; 269, 2; 275) depicts the prominent bulge of the calf muscles (gastrocnemius) in its posterior shape, whith the medial and lateral aspects barely distinguishable, although they are normally different.

[42]Smikros, Berlin, West, Antikenmuseum 1966.19, *ARV*^{2} 20, 3bis; *Para* 323; *Add*^{2} 154; Boardman, *ARFV*, fig. 31; Kurtz, *Euphronios. Atti.* (1992) 32; for "mistakes" in the painting of Euphronios: Arias, P.E, Hirmer, M., Shefton, B.B., *A History of Greek Vase-painting* (London 1962), 325.

vases assigned to the "Pioneers", Phintias, Euphronios, Euthymides and their companions.[43] On the face, the eye may be drawn in an asymmetrical almond shape which marks the difference between the outer and inner corner; the upper eyelid may be outlined (on Sarpedon's face, **V152A**, pl. 276, 1), and eyelashes added on some large figures. On the male trunk, in a frontal or profile view, the sternal depression, which is to become a standard feature of the male chest, is introduced.[44] In the inframammary region, the ribs are marked either in small strokes or in zigzag patterns, while the anterior border of a muscle of the back may be also added (latissimus dorsi);[45] in the abdomen, the stomach muscles may have a natural form suggested in irregularly shaped squares.[46] Although it was noted that upper and lower limbs usually display anatomical features in conventional patterns, on some vases attributed to the Pioneers further muscles,[47] bones,[48] and tendons are rendered,[49] while folds of

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[43]Beazley, *VAM*, 27; and *ARV*^{2} 13.

[44]**(V7, V21, V51, V130, V156, V198, V209, V215, V221, V238)** (pls.186, 1; 262, 2; 286, 1; 289; 291, 2), and among earlier painters, Oltos sometimes draws it in three decorative diverging curves (**V102**).

[45]*E.g.*: **V130, V198, V215, V229, V235** (pls. 263, 295, 2).

[46]**V130, V152, V188, V215, V235Y 1972.11.10)** (pls. 76, 1; 262, 2; 284).

[47]On the upper limbs, the medial boundary of the muscle of the shoulder (deltoid) (**V130, V138, V198, V221**) (pls. 265, 1; 269, 2), and flexors on a flexed forearm in prone (**V2,V215**) (pl. 170, 2; 289, 2), on the lower limbs, the inferior bulges of the main muscles of the thigh (vastus lateralis and medialis) (**V130, V153, V188, V198, V215**) (pls. 170, 2; 264; 276, 2; 289, 2; 290).

[48]On the upper limbs, the volume of the elbow, the subcutaneous border of a bone on the forearm (the ulna) (**V22, V152**) (pls. 176, 2; 275, 2) and its head on the wrist (**V152, V153**) (pl. 176, 2); on the lower limbs, the subcutaneous border of the tibia, and the ankle (**V152, V215, V221, V229**) (pls. 283; 289, 2).

[49]On the hands (**V130, V152, V188**) (pl. 283) and foot (**V152**), and on the lower limbs, the hamstrings at the bent of the knee (**V2, V152, V188, V198**) (pls. 171; 286, 1) and the Achilles tendon (**V235**) (pl. 236).

skin may be added on the joints,[50] and nails on the fingers and toes.[51] Yet, the taste for decorative shapes may be seen in the rendering of these features. This is well illlustrated by the "elaborate multi-line knee" of Sarpedon by Euphronios (**V152**) (pl. 275, 2) which is different from the common ovoid pattern (see fig. 1).[52] This distinctive rendering of the kneecap which translates into geometric patterns the head of the tibia and the slight depression below the knee reflects both the painter's fascination with the forms created on the surface of the body and his interest in an "exhaustive treatment of musculature".[53]

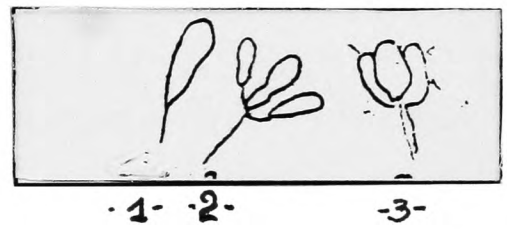

Fig. 1: 1. "Ovoid" knee-cap (**V20**); 2 (**V153**) & 3 (**V198**)"multi-line knee-cap"

Anatomical features on vases dating from the early decades of the fifth century are gradually more accurate than those described for late sixth century figures, and further details may be added. On faces in profile, the eye is drawn with its medial tip open, the iris gradually moved towards it to suggest the profile view of the eye; and the volume of the cheekbone is occasionaly rendered (**V105**) (pl. 244); on the growing number of faces shown in frontal view, the eyelids, and the volume of the cheeks and chin are added (cheek:**V193**; chin:**V78, V170**) (pls. 193, 2; 279, 1). On the male torso, a short curve marks the pit of the stomach at the

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[50]On the bend of the elbow, the wrist, on the bend of the knee, on the ankle, on the toes and finger joints (**V131, V152, V235**) (pl. 236).

[51](**V152, V221**). This feature also occurs on one known example of black-figure assigned to the Lysippides Painter (**V226**), but it remains even more exceptional in this technique.

[52]Kurtz, *Euphronios. Atti.* (1992) 33.

[53] Maxmin, J.J., "Euphronios's legs reconsidered", *AAA* 6 (1973) 301.

junction of the sternal depression and the inferior border of the pectorals;[54] and body hairs, which were only occasionally added in earlier vases (**V104, V142**[55]) (pls. 243, 271) occur more often on the male trunk,[56] and become even a common feature.[57] In the inframammary region, the interdigitations of the muscles on the flank (external oblique and serratus anterior) are clearly rendered on some figures,[58] and the medial and lateral aspects of some of the muscles of the upper and lower limbs are occasionally distinguished.[59]

Anatomical features which were represented with excessive care and the rendering of which helped to define the individual style of the Pioneers tend to disappear - the anatomy of the abdomen, of the upper and lower limbs, is usually less developed and not emphasised by a relief line,[60] folds of skin and nails on the hands and foot are barely added -[61], and vase-painters draw muscles in simpler lines which reflect a better understanding of the body as a whole rather than a fascination for a detailed and decorative rendering of its surface forms. On

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[54] *E.g.* **V93, V202** (pls. 234, 1; 287, 1).

[55]Assigned to the Madrid Painter, it probably illustrates the growing influence of red-figure on the style of some contemporary black-figure vases, Boardman, *ABFVAP*, 112.

[56]**V93, V137**.

[57]*E.g.***V117, V191, V233** (pls. 257; 285; 295), and see Cambitoglou, A., *The Brygos Painter* (Sydney 1968) 35.

[58] **V26, V76, V239** (pls. 179-180, 2; 193, 1).

[59]*E.g*: a roughly 'U'-shaped line for the biceps in the medial view of the upper arm: **V103** (pl. 241); and a less rounded shape for the calf in a lateral rather than in a medial view: **V70, V103** (pls. 190, 2; 240).

[60]**V1, V43, V70, V75** (pls. 169; 190, 2; 195, 2).

[61]The anatomy of the upper and lower limbs is less developed and not emphasized by a relief line (except for the kneecap and the tibia line) as it was on the Pioneers' vases, Tiverios, M., " Σωσίας και Εὐφρόνιος", *AE* (1977) 5, and the drawing of folds of skin and nails on the hands and foot, considered Euphronios' hallmark, becomes exceptional.

some vases, the volume of some muscles and their interelation are further enhanced by a distinctive rendering: the shoulder-blades are not indicated by a square geometric shape but by two separate lines, the upper one continuing the contour line of the shoulder into the back (**V187, V211**) (pl. 288, 1),[62] the kneecap, in a frontal view, is not drawn in a close ovoid pattern but in a curve which does not join laterally (**V70, V100, V103**) (pls. 191, 2; 238; 240). Additionally, a median line which extends from the pit of the neck to the pubis (it includes the sternal depression and the linea alba) may be added on the torso of some figures (**V76**) (pl. 193, 1).[63] This "lengthened median line"[64] increases the unity of the various parts of the trunk (otherwise separated into the pectoral, stomach, and hips areas) in order to achieve a greater three-dimensional effect. It was described by Williams who notes that the painter "breaks the closed pectoral pattern (the usual "w-shaped" boundary),... lengthens the median line, ... immediately aware of the potential of this line to indicate the volume, for he skilfully inflects it, once to show the fullness of the chest and then a second time for the protrusion of the stomach ....".[65] The close observation and growing knowledge of human anatomy is further reflected in the rendering of flexed and extended muscles. Unlike earlier red-figure vase-painters who only occasionally outline the changing shape of muscles in motion and do not suggest

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[62]This open form was noticed by Richter, "The Kleophrades Painter", *AJA* 40 (1936) 106.

[63]Williams also notes this rendering on two pointed amphorae attributed to the Kleophrades Painter, but does not consider it as a stylistic hallmark of, but rather as an external influence not fully explored, Williams, *New Perspectives*, 297.

[64]*Ibid*, 295.

[65]*Ibid.*, 295.

ponderation on figures at rest,[66] the powerful contraction of flexed muscles is observed and their surface forms is recorderd with considerable accuracy (**V145**) (pl. 273, 1), while figures in quiet, motionless states display the balance of their body's weight accurately in detailed surface anatomy: the size of the flanks, the length of the inguinal line are differentiated, and the hips are at a slant (**V129, V227**) (pl. 261, 2; 292, 2).

On vases dating from the early fifth century, the growing knowledge of human anatomy is also reflected in the representation of the female body. With the advent of red-figure, there is an increasing number of *genre* scenes which portray naked hetairai consorting with men.[67] These female nudes, which were extremely rare in other contemporary media, were drawn in different poses and give the opportunity to vase-painters to experiment with the rendering of the female body. Until the turn of the century, female figures have narrow hips with a triangular-shaped torso, on which the interdigitations of the flank and abdominal divisions are sometimes added (**V33, 134, V181**) (pl. 266). The representation of the breasts remains a challenge: when the torso is shown in a frontal view, they are shown in profile, pointing in opposite directions over the contour, and the space left between them is

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[66]For instance, Euphronios distinguishes the rounded mass of the flexed muscle (biceps) from that of the extended one (triceps) which is drawn in a straight line on the slashing arm of Herakles and Telamon on the Arezzo crater, and on the forearm of the same figures, he marks the bulging mass of the flexor muscles in action and the prominence of their tendons towards the wrist (see Kurtz, *Euphronios. Atti* (1992) 32-33); Euthymides has outlined the muscle of the shoulder seen from above to suggest the arm in semi-pronation (**V131**).

[67] Peschel, I., *Die Hetäre bei Symposion und Komos in der attischrotfigurigen Vasenmalerei des 6.-4. Jahrh. v. Chr.* (Frankfurt 1987) 151-200.

unnaturally large.[68] From the early fifth century, the lithe contour of the female body is suggested, and its anatomy rendered with accuracy: the breasts are correctly distanced from each other (**V3, V100, V133, V148**) (pls. 172; 237; 239);[69] and anatomical details, such as the nipples, are convingly drawn. The pace of the development of female anatomy, which is slower than that of the male, may be explained by two reasons: the lack of tradition in treating female nudes, and the fact that the ideal naked body in Greek art is the well-trained male.[70] The development of a more accurate rendering of female anatomy, noted on vases dating from the early fifth century, reflects a growing interest in both male and female anatomy and in the beauty of the female body *per se*. The latter concern is further illustrated by the use of the female version of *kalos* (*kale*) which praises the beauty of a person and is related with a naked female on a cup attributed to Onesimos,[71] while, during the last decades of the sixth century, kalos names were only used, as far as I know, in their male version (*kalos*) and were associated with male names.

Along with the growing interest in a more accurate rendering of anatomy, a few distinctive anatomical details single an increasing number of figures out from the common type. Baldness, thick brows, a hooked or aquiline nose, widened teeth, a triple chin, and a fat belly may occasionally be seen. While in late sixth- and early fifth-century black-figure, these

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[68]**V33, V90, V212, 242** (pls. 227; 288-291; 297, 2).

[69]The reduction of the space between the breasts is paralleled with the gradually more accurate rendering of their shape, Reinach, "Un indice chronologique applicable aux figures féminines de l'art grec", *REG* 21 (1908) 18.

[70]Dover, *Greek Homosexuality*, 68-70.

[71] Brussels, Musées Royaux d'Art et d'Histoire A889, *ARV*^{2} 329, 130, *Para* 359, *Add*^{2} 217. Example mentioned by Cohen, B., "The anatomy of Kassandra's rape: female nudity

features are rare - only a hero with an aquiline nose (**V83**) (pl. 210),[72] and a bald aged man (**V143**) (pl. 272, 2) are known to me - in contemporary red-figure, they are more frequent and may be attributed to unfortunate mythological characters,[73] dwarfs with huge heads on tiny bodies (**V46, V144**),[74] symposiasts,[75] and giants (**V92**) (pl. 230, 2); and occasionally, faces such as that of a bronze-worker on a vase in Berlin (**V24**) (pl. 178, 2), have thick eyebrows, elongated eyes, and a short nose which may reflect the actual appearance of a fellow crafstman.[76] Although in both black- and red-figure vase-painting, the age of the figures is usually suggested by conventional means such as white hair for old figures, a beard for mature men, hairy cheeks for youths, and a small size for children, in some red-figure vases, it is also occasionally outlined by the rendering of anatomical features. Wrinkled foreheads and a double chin may emphasise the old age of some males and females (**V35, V41, V114, V141**) (pls. 182, 254, 2), while a wrinkled neck, pendulous breasts, and rolls of fat around the waist may be added on some female figures (**V110**) (pls. 252-253, 1). From the study of the known vases, it seems that Phintias introduced this unexpected interest in the ageing female form, which may be also seen on later vases, on either mythical,[77] or mortal females (**V108**) (pl. 251, 1).[78] On

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comes of age in Greek art", *Source. Notes in the History of Art* 12, no. 2 (1993) 41.

[72]Mentioned by Beazley, *Dev.* 81.

[73]Antaios, (**V188**) (pl. 283, 2), komasts (**V104, V172, V200**) (pls. 280, 1; 286, 2).

[74]For a list, Dasen, V., "Dwarfs in Athens", *OxfJA* 9 (1990) 191-200.

[75]**V89, V172** (pls. 222; 280, 1)

[76]A figure with a hooked nose, eyes with eyelashes and reddish hair, attributed to the Hegesiboulos Painter must be added to the list (**V144**). Its identification is much discussed: for Boardman, he is a jewish gentleman (*ARFVAP*, 126), for Heidenreich, the patron of a brothel (*AJA* (1985)581-586), for Beazley, an old man (*ARV*^{2} 1631; *Para* 339, *Add*^{2} 184).

other two red-figure vases (**V42, V113**) (pl. 184, 1),[79] the blond hair, snub nose, drooping lower lip of two droll figures reproduce the facial features of a half-grown boy, and depict what Beazley describes as "one of the first, one of the only, real child in vase-painting".[80]

Nonetheless, the physiognomy of these faces which usually reproduce the same features - bald forehead, hooked nose, wrinkled face and neck, and triple chin -[81], is a "typical" rather than individual realism, which illustrates types of figures (the old man and woman, the dwarf, the child) rather than contains something of an actual likeness.[82] In any case, these figures are not real portraits, as it was suggested by Frel regarding two hetairai depicted by Phintias (**V110**) (pls. 252-253, 1).[83] While Frel, by comparing the double chin of these figures with that displayed by a flute-girl painted by Euphronios and named Syko (**V138**) (pl. 269), notes that it may represent the real appearance of the girl, the strong chin of Syko seems to be the hallmark of a few Euphronian faces rather than an individualized feature. Additionally, the

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[77]Aithra: **V41, V114, V141** (pls. 183, 2; 255, 1; 270); old woman: **V93** (pl. 233 about Aithra see *LIMC* I (1981) 420-431.

[78]Pendulous breasts: **V108, V114, V244** (pls. 251, 1; 233).

[79]True, M., "New vases by the Brygos Painter and his circle in Malibu" *GV JPaul Getty M* 1 (1983) 73-84.

[80]Beazley, J.-D., Caskey, L.D., *Attic Vase-painting in the Museum of Fine Arts, Boston,* vol. 2 (Oxford 1954) 20.

[81] The few faces which display other features (the two children on **V42, V113**) (pl. 184, 1) and the craftsman on **V24** (pl. 178, 2) remain exceptionnal.

[82]According to Metzler, most of them can be grouped into two main classes: the aged and the abnormal figures, the latter beeing qualified as caricatures of dwarfs, who also show a disproportion between their head and body, *Untersuchungen zu den griechischen Portraits des 5. Jhd. v. Chr.* (Münster 1966) 27; on dwarfs, see Dasen, V., *Dwarfs in ancient Egypt and Greece* (Oxford 1993).

[83]Frel, *Greek Portraits in the J. Paul Getty Museum* (Malibu 1982), 6.

occasional representation of aged naked females, while naked males are usually portrayed in the frame of an ideal anatomy, seems to illustrate the derogatory and laudable character of the naked female body as it appears in ancient sources and in the iconography of late archaic vase-painting,: Attic tragedy and comedy refer to the immorality of Spartan women who dress in a way that exposed their bodies,[84] and in vase-painting, female nudes are limited either to hetairai (who are not respectable women), or to mythical characters in danger in order to emphasize their weakness and vulnerability (**V114, V141**) (pls. 253; 270).[85] On the other hand, the naked male body is praised for its beauty, and is often associated with athletic and heroic figures in literary sources and iconography.[86] This contrast betwen female and male nudity explains why vase-painters limit the depiction of aged features to female bodies, and why they sometimes use them as a deliberate exaggeration, hinting at the humour of a sexual scene between young men and older hetairai,[87] and do not reproduce the actual appearance of a life model.

From the turn of the century, emotion is also shown on a growing number of faces, and is gradually suggested with a wide range of nuances. Although laughing satyrs with bared teeth

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[84]*E.g.* Ar., *Lys.* 76-81; for Spartan female athletes and their nudity see Scanlon, "Virgineum Gymnasium. Spartan females and early Greek Athletics", *The Archaeology of the Olympics. The Olympics and other Festivals in Antiquity* (Wisconsin 1988) 185-216

[85]Bonfante, L., "Nudity as a costume in Classical art", *AJA* 93 (1989) 581; and Cohen, B., *Source, Notes in the History of Art* 12, no 2 (1993) 37-46.

[86]See Dover, *Greek Homosexuality*, 68-71

[87]Keuls, E., "The social position of Attic vase-painters and the birth of caricature" *Proceedings of the Third Symposium on ancient Greek and related Pottery* (Copenhagen 1988) 300.

are already portrayed on an early sixth century black-figure oinochoe[88] and on a mid-sixth century amphora,[89] this rendering emphasizes the grinning aspect of the satyrical mask which may have an apotropaic, and thus symbolic function,[90] rather than suggesting a specific emotion. In fact, the earliest known examples of facial emotion may be traced back to two vases, attributed to Exekias (*ca.* 540-530). The painter sets the pupil upwards in the eye to show the pain of a dying Amazon,[91] and incises wrinkles on the forehead and cheek to emphasise the mental strength of Ajax, who is preparing his suicide.[92] These devices are extremely rare in black-figure, while they are developed in early red-figure vases: the pupil set upwards in the eye becomes the conventional manner to outline pain and death on fighting figures (**V141, V209**) (pl. 270), and the wrinkled forehead expresses the effort or the pain (**V104, V200**) (pls. 243, 2; 286, 2). Further nuances are also introduced in the rendering of emotion: the injured Kydoime (**V2**) (pl. 170, 2), or the struggling Antaios (**V188**) (pl. 283, 2), with their pupil set upwards, are not yet dead but still in agony, while Sarpedon with his eyelids almost closed, is actually dying (**V152**) (pl. 276, 1).[93] These features may be combined alone or together with an open mouth, bared teeth (Sarpedon, Antaios), frowning brows

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[88]Athens, Agora Museum P 24945, Thompson, H.A., "Activities in the Athenian Agora: 1955", *Hesperia* 25 (1956) pl. 16.

[89]Attributed to the Affecter, Boston, Museum of Fine Arts 01.80.53, Korshak, Y., *Frontal Faces in Attic Vase-painting of the Archaic Period* (Chicago 1987) fig. 17; *ABV* 246, 72, *Add*^{2} 63.

[90]Kenner, *Weinen und Lachen,* 72.

[91]London, British Museum B210, *ABV* 144,7, 672, 2, 686, *Para* 60, *Add*^{2} 39, see for a detail of the figure, Arias, Hirmer, *Painting*, fig. 64 .

[92] Boulogne, Musée Communal 558, *ABV* 145, 18, *Para* 60, *Add*^{2} 40; pl. 300, 2.

[93]Kurtz, *Euphronios. Atti* (1992) 34.

(Antaios) (**V22, V89**) (pls. 176, 2; 222), and wrinkles at the corner of the mouth (**V153**) (pl. 276, 2) in order to increase facial emotion. The next generation of painters depicts similar emotions with a similar rendering,[94] but also outlines other (new) feelings and introduces new expressive features. Raised eyebrows may suggest surprise and anger (**V37B, V39, V96, V232**) (pl. 183, 1); a wrinkled forehead and an open mouth the pleasure of sexual intercourse (**V105**) (pl. 244); wrinkles at the corner of the eyes and around the nostrils the fear (Priam: **V114**) (V254, 2);[95] relief lines on the cheeks and around the eyes the swollen features of a wrestler (**V23, V98**) (pl. 177, 1); and on the growing number of frontal faces, the pupils of the eyes may occasionally point in the direction which holds the interest of the figure: a satyr playing flute has both pupils swing inwards to look at the instrument (**V132**) (see the satyr on pl. 265, 2), and, another has them pulled right to look at Iris (**V67**) (pl. 190, 1).

The interest in the rendering of emotion is developed at the same time as that in lifelike poses, and some vase-painters either combine expansive gestures with expressive facial features to emphasise the representation of *pathos*, or mainly use bodily poses to enhance the expressive power of some figures. The movement of the head (flexed or extended) may outline the effort of singing (**V200**) (pl. 286, 2), or the pain of a warrior (**V22**) (Pl. 176, 2), and wide gestures the dramatic action. Although upper limbs were occasionally depicted pronated and supinated in black-figure, a better understanding of these movements is shown in red-figure dating from the last quarter of the sixth century, and painters apply this growing knowledge to

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[94]*E.g.* of injured figures with the pupil set upwards in the eye: Kleophrades Painter (**V75**) (pl. 192, 2), the Berlin Painter (**V13, V58**), and the Brygos Painter (**V191**) (pl. 285), Douris (**149**). Effort: flautist, **V39**.

[95]Williams, *GV JPaul Getty M* 5 (1991) 41-61.

move away from the conventional gestures.[96] On a crater in New York, Euphronios portrays the dead Sarpedon with his right arm (supinated) hanging over his injured body (**V152**) (pl. 275, 2) and the left one extended and lying on the ground, and does not employ the more conventional gesture of the "dead", usually portrayed with the right arm around the head in black- and red-figure vases.[97] The facial emotion of the hero and its attitude enhance the poignancy of his fate. Similarly, in the Sack of Troy, Onesimos (**V114**) (pl. 254, 2)[98] and the Kleophrades Painter (**V141**) (pl. 270), suggest facial emotion with wrinkles, frowning brows, open mouth and bared teeth, and depict dying warriors in tortuous poses, the head flexed or extended, the arms lying on the ground, and the lower limbs flexed. In fact, the treatment of expression for the same subject varies according to the vase-painter. A comparison between the Sack of Troy of the Kleophrades (**V141**) and Brygos Painters (**V191**) (pl. 285) show that the latter does not make a full use of facial emotion which he limits to an open mouth or raised brow and mainly demonstrates expressiveness of pose in figures such as the fleeing or fighting

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[96] See Mac Niven, T.J., *Gestures in Attic Vase-painting: Use and Meaning. 550-450 B.C.* (Ann. Arbor, Michingan 1996) for the increasung number of gestures reproducing those seen in everyday life activities (such as the youth folding his cloak, **V20** (pl.180, 1), or the wrestler who presses his thumb into his opponent's eye,**V98** (pl. 236, 1).

[97] *E.g.* in black-figure, Group E: Kassel, Staatliche Kunstsammlungen T674, *ABV* 135, 31bis; *Para* 56, *Add*^{2} 36; CVA Kassel I, pls. 21,2; 23,1-3; in red-figure, **V86, A; V154A** (pls. 215; 277, 1). For the development of this gesture and its association with sleeping figures, see Connor, P.J., "The dead hero and the sleeping giant by the Nikosthenes Painter", *AA* (1984) 384-394.This gesture has been extended to singing komasts and becomes a common practice for these figures (*e.g.***V38, V51**) (pl. 186, 1), see Beazley, "Brygan symposia", *Studies presented to D.M. Robinson* 2 (1953) 74-75.

[98]Another, very fragmentary Iliupersis cup in Berlin 2281 and Vatican displays figures with a similar emotional power. It has been qualified as early proto-Panaetian by Beazley (*ARV*^{2} 19,1-2), and attributed to Onesimos by Williams, who considered it an early work, Williams,*JbBerlMus* 18 (1976) 9-23.

women and a dying warrior, while the former combines facial emotion with expressive and lifelike poses.[99] The Kleophrades Painter portrays women seated on stones, the head flexed in despair, tearing their loosened hair in mourning, and Priam covering his bleeding head with his hands; for this reason, his rendering was descibed by Beazley as the "expression of figures of extraordinary intensity, female figures of visionary beauty".[100] Additionally, these painters reflect their own view of a cycle of dramatic stories which might have had a common source of inspiration,[101] and dwell on different aspects of the same story: the Kleophrades Painter shows the effect of the defeat in his group of mourning women,[102] while the Brygos Painter and Onesimos stress the Greek victory over Troy where only relatives and friends of the Greeks are saved.[103]

Some scholars note the frequent occurrence of snarls on the faces of defeated figures (opponents to heroic and mythical characters), and associate the drawing of expression with the lower status of the depicted figure, which has to be barbarian, villain or of a lower social rank, such as a slave.[104] Yet, it is difficult to accept the proposed association since, in several

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[99]Wide gestures of the arms and expressive poses of the body are combined with expressive faces on other figures attributed to the Kleophrades Painter, maenads: **V132, V193** (pl. 265, 2).

[100]Beazley, *The Kleophrades Painter* (Mainz 1974) 12.

[101]For the sack of Troy, the *Iliupersis* attributed to Arktinus of Miletus and for some episods, the *Little Iliad* attributed to Lesches of Mytilene, both living around the 2nd half of the 8th c. B.C., Wiencke, M. I., "An epic theme in Greek art", *AJA* 58 (1954) 285-306.

[102]About the special interest of the Kleophrades Painter in the scenes from the *Iliad*, Boardman, "The Kleophrades Painter at Troy", *AntK* 19(1976) 3-18.

[103]See Boardman, *AntK* 19 (1976) 3-18.; and Williams, *GV JPaul Getty M* 5 (1991) 61.

[104]Frel, *Greek Portraits*, 9; followed more recently by Buitron-Oliver, *Douris*, 30, who notes: "Heroes and gods show only calm, ideal beauty, while his (Douris') sub-humans and

instances, pain, fear, and effort are suggested on mythical figures of kings (Priam:**V114**) (pl. 254, 2), on dying, suffering, and angry heroes (Patroklos: **V22** (pl. 176, 2), Sarpedon:**V152** (pl. 276, 1), Ajax:**V232**[105]), and on singing komasts (**V200**) (pl. 286, 2), who do not belong to any "lower class". The significant number of expressive faces displayed by defeated or injured figures may be explained by the action depicted rather than by the identity of the figure. Red-figure vase-painters were increasingly interested in the rendering of emotions, and they seem to have found it easier to experiment with facial emotion on figures in dramatic situations (death, defeat, and agony) which enhance the *pathos* and make it easier to depict.

In the section on sculpture, it was already noted that the interest in emotion is developed at about the same time as the newly born Attic tragedy which also displays a similar interest in the human passions. Although it was shown that it is impossible to demonstrate a direct influence of the theatrical mask on the rendering of facial expression since the former is limited to a conventional representation,[106] while the latter may gradually display a wide range of feelings, it is possible to show that some emotionally charged plays may have inspired contemporary vase-painters who were interested in the rendering of emotion. We are told by Herodotus that the tragic-writer Phrynichos was famous for touching emotionally his public, and was fined 1000 drachmas because his "Capture of Miletus" moved too much the

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villains display grimace and snarls".

[105]About the representations of Ajax, Williams, "Ajax, Odysseus and the arms of Achilles" *AntK* 23 (1980) 137.

[106]For an influence in vase-painting see Robertson, *HGA*, 283, 354; Kenner, *Das Theater und der Realismus*, 11-61; Stanford, W.B., *Greek Tragedy and the Rendering of Emotions* (London 1983), 82-84.

Athenians.[107] A play attributed to Phrynichos and another to Thespis may be related with two subjects depicted by Euphronios in which he emphasises the facial emotion of his figures: Herakles wrestling against Antaios, and the murder of Pentheus. While the fight between Herakles and Antaios occurs on the extant vases dating from the last quarter of the sixth to the first quarter of the fifth century and disappears afterwards,[108] it is that painted by Euphronios (**V188**) which shows a psychological dimension on the face of Antaios, absent from contemporary and later representations. This might be due, to a degree, to the large size of the figure allowing the rendering of a greater number of details,[109] and to the particular interest of the painter in suggesting emotion, but also to the influence of Phrynichos' drama named "Antaios and the Libyans" in which Herakles stuggles against Antaios,[110] and of whom a scholion to the Pindaric *Isthmian Hymns* says that he was "inhuman and without religion",[111] and, similarly, the murder of Pentheus may have been inspired by Thespis' play.[112] Both plays were contemporary to the vases decorated by Euphronios, and might have influenced a particularly talented painter to stress the facial expression and the psychological strength of

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[107] Hdt 6.21. 9-10.

[108]See "Antaios", *LIMC* I, (1981) 801-811.

[109]The other known example of a face with several added details is that of Priam on a very large size cup attributed to Onesimos (**V114**) (pl. 253, 1).

[110]Suda, *s.v.* Phrynichos, his first victory is dated to 511-508, and he is said to have been the first to have introduced a female face on the stage and to have written a variety of plays, among which "Antaios the Libyan", ed. Snell, "Tragici minores testimonia et fragmenta" *Tragicorum Graecorum Fragmenta* I (Göttingen 1971) 69, and Pickard-Cambridge, A., "Phrynichus", *Dithyramb, Tragedy and Comedy*^{2} (Oxford 1962) 62-65.

[111]*Scholia in Isthmionicarum Carmen* IV, 87a, ed. Drachmann, A.B., *Scholia vetera in Pindari carmina*, vol. 3 (Leipzig 1927) 235-36.

[112] Suda, *s.v.* Thespis [Hes.], see *Tragicorum Graecorum Fragmenta*,^{2} (Göttingen

these figures.

The rendering of anatomical features which outlines the age or a distinctive characteristic of a figure is developed at about the same time as facial emotion, and participates in the growing interest in exploring a more naturalistic rendering of the human figure, despite the limits described above in the development of portraiture. Both atypical anatomical features and facial emotion were not conventional attributes commonly used by vase-painters to distinguish figures one from the other and to suggest a dramatic scene. They result from a growing knowledge of human anatomy which helps the development of a more accurate rendering of anatomical features, and which may single some figures out and suggest a wide range of feelings. It is also significant that these distinctive anatomical features, emphasized according to the painter's taste and ability, become frequent at the same time as the Pioneers praise and portray each other on their vases. Although these representations of themselves appear in the guise of an ideal type which can be only identified by inscriptions,[113] we may note with Beazley that "for a moment the artist, one might say, seems to edge his everyday personality a little further into the world of his creation",[114] and that, both a specific rendering of anatomical details and the Pioneers' inscriptions, might reflect a "naturalistic" care for some aspects of the human figure.[115]

1971) F1.

[113]About the *kalos* names, a summary of their different functions, and their limits in identifying figures: Laurens A-F., "Les ateliers de céramique", *Culture et Cité*, 170-177.

[114]*VAM*, 19.

[115]Term used by Metzler to distinguish these faces from a "portrait", *Untersuchungen zu den griechischen Portraits des 5. Jhd. v. Chr.* (Münster 1966), 20.

According to the surviving material, facial emotion and individualized anatomical features occur mainly on figures taking part in newly treated episodes of already known subjects and stories; the association between these experiments and new iconographical subjects confirms that the former are breakthroughs in the conventional rendering which were carried out more easily in less traditional scenes. They appear, for instance, on the face of Antaios (**V188A**) (pl. 283, 2),[116] Aithra rescued during the Sack of Troy (**V41B, V114, V141**) (pls. 183, 2; 255, 1),[117] the dead Sarpedon (**V86, 152**)[118] (pls. pl. 215; 275, 2) and on those of the opponents of Theseus on the road to Athens (**V93, V166, V209**)[119] (pls. 232, 1; 233; 234, 1)which are subjects introduced in Attic vase-painting dating from the end of the sixth century. As if the painters experimented with their new interest in facial expression and distinctive features in new scenes with either emotionally charged (the dead Sarpedon, the dead Achilles carried by Ajax), or contrasting figures (the hero and his opponent, the old Aithra rescued by her victorious grandsons).

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[116]Developed by the Leagros Group and its contemporary, "Antaios" *LIMC* I (1981) 801-811.

[117]Developed in the first quarter of the 5th century B.C., "Aithra" *LIMC* I (1981) 420-431, a little bit earlier, around the end of the sixth century (e.g. of the cup attributed in the wider circle of the Nikosthenes Painter) for Boardman, *AntK* 19 (1976) 8.

[118]von Bothmer, "The death of Sarpedon", *The Greek Vase* (New York 1981) 63-80; "Sarpedon" *LIMC* VII (1994) 698-699. The removal of a body from the battelfield entered into the repertory of vase-painting on an amphora in (Leipzig, Antikenmuseum der Karl-Marx Universität T 2176) which portrays a fallen warrior being lifted by two warriors; *CVA* Leipzig 2, pl. 11.

[119]The deeds performed by the young Theseus on his journey from Troizen to Athens are depicted on vases from the late sixth century B.C. onwards; scholars have argued that an epic Theseid, composed around the same period, must have recounted this story; "Theseus" *LIMC* VII (1994) 922; 925-929 ; about the invention or adjustment of some aspects of the myth in the service of Athenian state, family or politics see, Boardman, "Herakles, Theseus

Along with a more accurate rendering of anatomical features, the red-figure technique, with the use of brush and relief line, makes possible the introduction of tonal gradations which allow the distinction between the varying volumes of the anatomical features and help to enhance the three-dimensional rendering of the human body. Although in early red-figure, vase-painters, who also worked in black-figure, use mainly the relief line which increases the decorative effect of the depicted muscles, from around the last decade of the sixth century, the Pioneers gradually combine both the relief and the dilute line.[120] In their vases, relief lines draw major internal details (collar bones, pectorals, shoulder blades, spine and hips) and dilute glaze lines mark other muscular planes and patterns (abdominal divisions, muscles of the legs and arms). The specific use of each indicates the difference between features projecting a stronger and softer shadow,[121] the former suggested in dark, the latter in light lines. The relief line is also used to suggest the swollen features which have a strong volume on the face of some wrestlers (**V23A, V98**) (pl. 177, 1);[122] and dilute glaze is applied on facial features in order to mark the light wrinkles of the skin, such as those of the upper and lower eyelids, of the wings of the nose (**V152**) (pl. 276, 1) ,[123] the furrows of the brows, the wrinkles at the corner of the eyes (**V114**) (pl. 254, 2); and is occasionally added on the interior areas of some muscles in

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and Amazons", *The Eye of Greece*, 1-28.

[120]On vases considered as early works (**V154**) (pl. 277, 1), there is also an extensive use of relief line for the anatomical features, which probably shows the influence of Psiax (von Bothmer, *Dialexeis* (1986-1990) 27-29).

[121]See Williams, *New Perspectives*, 289

[122]London, British Museum E78, *ARV*^{2} 401, 3; 1651; *Para* 370; *Add*^{2} 230; see Beazley, "A Greek realist" *Greek Vases Lectures by J. D. Beazley*, ed. Kurtz, D.C. (Oxford 1989) 80.

[123]Description in *Euphronios* (Paris 1990), 77, no. 4.

order to enhance their volume (*e.g.* **V51**) (pl. 186, 1). Williams describes a further innovation in the system of tonal gradation introduced on some vases dating from the early fifth century:[124] the continuous line which draws a single anatomical feature is sometimes rendered partly in black and partly in dilute glaze in order to show with accuracy the areas where the muscle has more volume and cast more shadow (in relief line) and those where it is is flattened (in dilute glaze).[125]

Attempts to suggest shadow may be also seen on some red-figure vases. It is rendered in dilute glaze applied in washes on the hollows of the stomach muscles of some large scale figures dating from the last decades of the sixth century and attributed to Euphronios (**V152, V188**) (pl. 275, 2). A similar rendering may be also noted on some contemporary vases although it is applied in a less convincing manner which probably shows that this technique was copied by less skilled vase-painters who were related with Euphronios: a wash of dilute glaze encloses the stomach muscles on figures attributed to the Nikosthenes Painter,[126] or considered to be from the workshop of Chachrylion (**V36, V87**) (pls. 218; 220). The composition of the Nikosthenes Painter' s scenes in which brown wash colours the abdominal hollows of some figures reflects Euphronios' influence since it recalls the compositon seen on the Antaios and Sarpedon craters (**V152, V188**): it shows a central group (Herakles wrestling

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[124]*New Perspectives*, 296.

[125]*E.g.* **V76, I** (pl. 193, 1): on the torso of the runner, the medial contour of the pectoral is drawn in dilute glaze, while at the flank, over the serratus anterior, where the pectoral has more volume, the painter adopts the relief line.

[126]Boston, Museum of Fine Arts 00.334, *ARV*^{2} 126,27; *Para* 333; *Add*^{2} 176; the feature was noted on the kantharos by Denoyelle, M., "Autour du cratère en calice Louvre G110 signé par Euphronios", *Euphronios peintre* (1992) 54-55, fig. 8.

with the lion, two figures wrestling) formed by figures with detailed musculature in relief line, and flanked by secondary, more simply drawn figures. The vase-painter who decorated the cup made in Cachrylion's workshop may also have been influenced by Euphronios since it is acknowledged that the latter also worked with this potter.[127] Although also very limited, there is another way to suggest shadow which is introduced in the early decades of the fifth century: hatched shading in dilute glaze. Williams notes this rendering on metal objects, and once on a human body;[128] but another example may be added to this list: the slight hatchings in dilute glaze on the thighs and the lateral side of the pectorals of two fallen Trojans on a cup assigned to the Brygos Painter (**V191**) (pl. 285).[129]

These early representations of shadow remain exceptional, and are taken up only by some mid-fifth century vase-painters who add shadow to the chest and stomach muscles,[130] and by the late-fifth century Group of Huge Lekythoi which probably reflects experiments in contemporary free painting.[131] According to Plutarch, the credit for having invented the

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[127]Williams, "Euphronios' contemporary companions and followers", *Euphronios peintre* (1992) 84.

[128]On the bellies of the centaurs on a psykter in the Villa Giulia, Rome, Villa Giulia 3577; Williams, *Ibid.*, 294, note 38.

[129]I saw the vase, and although M. Denoyelle considers this rendering as body hair, I tend to prefer the suggestion of shadow, since on most of the known examples hair is usually added on the chest and abdomen, Denoyelle, *Chefs-d'oeuvre de la céramique grecque dans les collections du Musée du Louvre* (Paris 1994), no 56, 122.

[130]Achilles Painter, Rome, Museo Gregoriano Vaticano 16571, *ARV*^{2} 987, 1; 1676; *Para* 437; Add2 311; *LIMC* I (1981) pl. 145; and other examples mentioned by Williams, *New Perspectives*, 290.

[131]See for instance, Berlin Staatliche Museen (East) 2684 ; *ARV*^{2} 1390; Kurtz, *Athenian White Lekythoi. Patterns and Painters* (Oxford 1975) 71-73, pl. 54,2.

technique of painting with light and shade was attributed to Apollodoros, a painter of the last quarter of the fifth century. The writer describes the "fading out" or gradation (φθορά) and the "laying on" or "building up" (ἀπόχρωσις) of shades of colour as the painting technique used by Apollodoros in order to give the impression of shadow.[132] Although this is a more naturalistic method of shading, the primitive technique observed on the vases which is not combined with the complementary concept of highlights,[133] seems more appropriate to the drawing technique and reflects the growing interest of increasing the illusion of depth, achieved either by a tonal gradation used for the drawing lines (relief and dilute), or by a dilute brown wash or hatching.

2. POSES

In black-figure, the human body is usually drawn either in profile (head, torso and limbs), or with the head and legs in profile and the torso in a full front or back view. While there are some occasional attempts to reproduce lifelike poses, they are probably influenced

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[132]*De glor. Ath.* 2. 346a: Ἀπολλόδωρος ὁ ζωγράφος ἀνθρώπων πρῶτος ἐζευρὼν φθορὰν καὶ ἀπόχρωσιν σκιᾶς Ἀθηναῖος ἦν. Following this description modern scholarship has accepted Apollodoros as the inventor of the shadow painting. For a convincing analysis of the technical terms φθοράν and ἀπόχρωσις, see: Rouveret, A, *Histoire et Imaginaire*, 39-49; Although the term σκιαγραφία was associated with Apollodoros' work in ancient texts (Hes., *s.v.* σκιά; Schol. *Il.* 10. 265, *s.v.* πῖλος ἀρήρει), and translated by "shadow painting" (Pollit, *Ancient View*, 250-254) this meaning is not always accepted, see with a summary of the discussion, Rouveret, *Histoire et imaginaire*, 11-63.

[133]Attempts at shading combined with highlights may be seen on a fourth century pelike from Panticapaeum, St Petersburg, Hermitage Museum unknown inventory number, Rumpf, A., *Malerei und Zeichnung* (Munich 1953) 145; pl. 47,4.

by red-figure, since they remain exceptional and show the body in anatomically impossible combinations.[134] This part, therefore, focuses on red-figure vases since it is with the development of this technique that experiments with more lifelike poses are gradually carried out.

i. Frontal view

There are some anterior views of the face and body. A standing figure in action can have a frontal torso and an extended non-weight-bearing leg (the other in profile),[135] and the lying or falling figure a leg so strongly flexed that only the front of the thigh and the foot is visible.[136] The latter pose may be developed further: on the dying Kyknos (**V153**) (pl. 276, 2), Euphronios draws part of the lower leg and foot, usually hidden by the thigh of figures in a similar pose.[137] The flexion of the muscles in the thigh is rarely shown, but it may be depicted by two lines that diverge laterally and medially and mark the furrows created by sartorius and tensors (**V130, V153**) (pls. 263; 276, 2).

From around the early fifth century, the number of frontal poses increases, and a greater variety may be seen in their rendering. For instance, the squatting or seated figure,

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[134]See for instance, **V160, V206,** (pl. 287, 2) which were probably influenced by red-figure. For the Madrid and Tarquinia Painters, Moon, "Some new and little-known vases by the Rycroft and Priam Painters", *GV in the JPaul Getty M* 2 (1985) 40-70, and about the influence of the red-figure rendering on black-figure, Boardman, *ABFV* 103-104.

[135]*E.g.* in red-figure: (**V230, V236**) (pls. 293, 1; 297, 1).

[136]**V45, V121, V188** (pls. 223; 283, 1).

[137]Another example is a contemporary cup (**V31**) assigned to the Thalia Painter; for his links with Euphronios through the workshop of Cachrylion, see Williams, "Euphronios' contemporary companions and followers", *Euphronios peintre* (1992), 87.

which was usually shown with one lower leg in a frontal view and the other in profile, may have both lower limbs depicted frontally. [138] The standing figure with a frontal weight-bearing leg and the other non-weight-bearing in profile, which probably originates with the Pioneers since most of the early known examples occur on their works,[139] also becomes more common.[140]

As regards the face shown in a frontal view, several scholars have tried to connect it with specific iconographical groups and to explain its rare use symbolically. They relate the frontal face either to drunken, sleeping, dead or dying figures, or to satyrs, centaurs and Gorgoneia, and understand it as a means of suggesting the uncommon and abnormal state of the figure (dead, drunk and sleep), or representing monsters and wild creatures (satyrs,

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[138]Although the squatting male figure appears already in black-figure of the first half of the sixth century, it is shown with a frontal torso and profile lower limbs in an anatomically impossible combination, while the flexed lower limbs are shown frontally (either one or both of them) only from the last decades of the sixth century. Cohen suggests that it was Epiktetos who introduced this pose (Cohen, *Bilingual Vases*, 411) although it is difficult to demonstrate, see also,Mac Sweeney, A., "A red-figure cup by Epiktetos and Pamphaios", *Allen Memorial Art Bulletin, Oberlin* 25, no 3 (1968) 105-113. *E.g.* of seating or squatting figures: **V7, V24, V91** (pls. 177, 2; 230, 1).

[139]Only two known examples are known outside the Pioneer Group: Epidromos Painter, Saint Petersburg, Hermitage Museum 664, *ARV*^{2} 117,4; *Add*^{2} 174 (for an early fifth century date for his production see Williams, "Apollodoros and a new Amazon cup in a private collection", *JHS* 97 (1977) 168) Carpenter Painter, Malibu, J. Paul Getty Museum 85.AE.25, see von Bothmer, "An Archaic red-figured kylix", *J.Paul Getty M J* 14 (1986) fig. 1d (for dates and style see von Bothmer, *ibid.*, 20; Pinney, G. F., "The nonage of the Berlin Painter", *AJA* 85 (1981) 148-150). Pioneers, see for example (**V20, V116, V130, V131**) (pls. 180, 1; 262, 1).

[140]For a detailed analysis of this pose see Kielland, E. Chr., *The Human Figure: the Development from the Egyptian to the Greek Way of presenting it in Paintings, Drawings and Reliefs* (Oslo 1947) 22. *E.g.* (**V70, V77, V130, V131, V211**) (pls. 190, 2; 262, 1; 288, 1).

centaurs and Gorgoneia).[141] Korshak has remarked that frontal faces in Attic vase-painting of the archaic period fall into two major iconographical groups: first, satyrs, and a related group of komasts and symposiasts; and second, combat victims and a related group of losing athletes.[142] Although she acknowledges the weakening of this iconographical association at the end of the sixth century B.C., she notes that "it is fair to say that behind almost every frontal face in Attic vase-painting of the Archaic period lies ultimately the frontal face of the Gorgon".[143] For Korshak, the use of the frontal face is associated with a state of diminished control and with the underlying presence of an iconographical model, the Gorgon, connected with the satyr-group through the image of the mask, and with the victim-group through the representation of defeat.

Although frontal faces might be associated with the image of the mask on black-figure representations until the last quarter of the sixth century B.C. - a significant number belong to satyrs, or to figures connected with the Bacchic world and its association with wine (komasts and symposiasts), and the rest are divinities whose face may be represented by a mask (Dionysos) -[144] the proposed parallel between frontal faces of defeated or dying figures and the underlying iconography of the dying Gorgon may not be valid. Combat figures with frontal

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[141]Frontisi-Ducroux, "Au miroir du masque", *La cité des images* (Paris 1984) 147-162; Vernant J-P., *La mort dans les yeux, figures de l'autre en Grèce ancienne, Artemis, Gorgô* (Paris 1990).

[142]Korshak, *FF*, 5.

[143]*Ibid.*, 43-44.

[144]See Frontisi-Ducroux, *Le dieu masque. Une figure de Dionysos d'Athènes* (Paris 1991).

faces appear with the invention of red-figure. With the new technique and its use of the brush for inner details, painters introduce new facial features to stress pain, agony and effort, and to depict emotion. It is easier to expand the range of expressive features on a frontal face (painters add more details than on the faces in profile), and this may explain why its use is mainly limited to figures emotionally charged ("in a state of diminished control").[145] In this case, the early red-figure examples show the awakening interest in exploring a more naturalistic rendering of the human face and are not related to the mask-like face of the dying Gorgon. On the faces of satyrs and komasts usually associated with the image of the mask by Korshak, details are also added in red-figure to suggest emotion or effort. [146] Finally, it is likely that a red-figure influence might explain the appearance of defeated warriors with frontal faces in black-figure since they remain rare and appear late in this technique.

From around the early fifth century B.C., the number of frontal faces increases slightly and extends to new iconographical groups.[147] While the depiction of emotions continues, some other details, already described in Part I, are added: the pupils of the eyes point to the direction which holds the interest, they swing inwards on a satyr playing flute (**V132**) (pl. 265, 2) or are pulled right on a satyr looking at Iris (**V67**) (pl. 190, 1), and the volume of

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[145]Frontal heads as a means of suggesting expression: Greifenhagen, A., *Ein attische Schwarzfigurige Vasengattung und die Darstellung des Komos im VI. Jahrhundert* (Königsberg 1929) 69-75; Tsingarida, A., "La question de la frontalité des visages dans la céramique attique", *AHAA de l'Université libre de Bruxelles* 13 (1991) 7-18.

[146]*E.g.* wrinkles (**V221**) (pl. 291).

[147]Female and beardless male figures, *e.g.* athletes **V195**, archers **V170** (pl. 279, 1), and further examples see Korshak, *FF*, 25-34.

cheeks and chin is oultined.[148] From now on, frontal faces together with other more bold foreshortened aspects of the head and body reflect the experiments with a three-dimensional rendering of the human figure.

ii. Back view

The posterior view of the body remains rare in early red-figure, and that of the head is even more exceptional, usually suggested as a flat form encased in a helmet (**V147A, V199**) (pl. 274, 1). Standing or kneeling figures can be seen with the torso, buttocks and one leg (the other is in profile) in posterior aspect.[149] Vase-painters progressively try bold foreshortenings of either the lower leg of kneeling figures,[150] or the weight-bearing foot of standing ones.[151] In early fifth-century vases, stances already seen in a frontal view are now seen from the back.[152] And on falling or kneeling figures, the partially extended profile leg may be placed in front of the flexed leg shown in a posterior view,[153] a stance that enhances "the agony of death in battle" and shows a deeper knowledge of the structure of the body and the effect of movement

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[148]Cheeks: **V64, V193** (pl. 189, 1) chin: **V170, V178** (pls. 193, 2; 279).

[149](**V2, V130, V135, V217, V235, V242**) (pls. 263, 1; 267, 1; 295, 2-296).

[150]For instance, compare (**V75, V135, V243**) (pls. 192, 2; 267, 1).

[151](**V8, V135, V141, V180, V235**) (pls. 267, 1, pl. 270 295, 2).

[152]For the balance of weight on standing figures seen from the back: **V8**, **V129** (pl. 261, 2); for the slashing stance (one weight-bearing flexed forward and the other extended (**V141, V166**) (pl. 270, 1).

[153]**V75** (pl. 192, 2).

on its parts by the vase-painter.[154]

The dorsal view of a reclining man placed at one end of the picture becomes a favourite motive in red-figure symposia of the early fifth century. This pose, combined with the back view of the couch, suggests a spatial depth in the symposium scene and may reflect the actual disposition of the couches in a room (two couches on their long side and one on its short as it may be seen on actual public symposium rooms).[155] It is not clear whether this pose was introduced by late sixth, or early fifth century vase-painters. Until recently, there was only one known example of a symposiast in a back view assigned to an older vase-painter, Epiktetos (**V90B**) (pl. 229); Since this cup bears the name of Python, a potter closely associated with Douris who often represents reclining symposiasts in a similar pose (**V94, V207**) (pl. 234, 2), Robertson suggests that Epiktetos must have borrowed this attitude from Douris, hence deducing that Epiktetos still decorated vases in the early fifth century.[156] A recently published fragment dated on stylistic grounds to around the last decades of the sixth century, displays a similar pose and suggests that the symposiast in a posterior view was probably developed already among the Pioneers.[157]

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[154]Kurtz, *Euphronios. Atti* (1992) 34.

[155]For the back view of the couch and symposiast and the arrangement of couches in actual common rooms, see Bicknell, C.D., "Some vases in the Lewis Collection", *JHS* 41 (1921) 223; also Tomlinson, R.A., "The chronology of Perachora hestiatorion and its significance" *Sympotica. A Symposium on the Symposion,* ed. Murray, O. (1990) 93; see also reconstruction of the stoa in Brauron, Bouras C., *Η Αναστήλωση της στοάς της Βραυρόνος* (Athens 1987) 21, fig. 5.

[156]Robertson, "Beazley and after", *MüJb* 27 (1976) 29-46; *AVPCA* 87.

[157]Basel, Cahn Collection 680 fr., Williams, *New Perspectives*, 292.

iii. Three-quarter view

The three-quarter view of the body (trunk and limbs) is attempted in early red-figure. The near frontal view of the torso is often suggested by the old combination of the chest in a frontal view and the lower part of the trunk and limbs in profile.[158] The movement may be emphasized further by drawing the abdominal muscles on the near side of the stomach in an unnatural rendering. On a few other figures, the painter combines different points of view for the muscles, also in an impossible anatomical combination, in order to suggest the rotation of the trunk. [159] The less common posterior three-quarter view is shown in the conventional combination of a full dorsal view of the trunk and profile lower limbs; on the well-known komast (**V130**) (pl. 263), of whom Euthymides was so proud, it is only the drawing of the spine that indicates how the figure turns, leading the eye from the full view of the back to the profile view of the legs. Different points of view are also used for experiments with the rotation of the lower limbs (**V62, V154**) (pls. 188, 1; 277, 1): the thigh usually outlined in profile and the lower leg in a frontal view, also an impossible anatomical combination.[160]

Three-quarter views of the head are attempted only from the early fifth century. In

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[158](**V88, V151, V188**) (pls. 275; 282, 1).

[159]For instance, the chest is drawn with its far-side pectoral in profile, the near-side in a frontal view, and the stomach with the abdominal muscles in a frontal view, the far-side flank contracted and the near-side in profile.

[160]A less advanced rendering is seen on a warrior by Psiax (**V62A**) (pl. 188, 1), with the lower leg outlined in profile, and its anatomical features (knee, tibia and calf) in frontal view. For Psiax's influence on the Pioneers, see Williams, *New Perspectives*, 287; Robertson, *AVPCA*, 13.

order to suggest a slight turn, there are deviations from a strictly frontal face: the hair may swing asymetrically around a tilted face (**V93**) (pl. 232, 1) and, as Beazley has noted, more of the neck can be drawn on one side while it is completely hidden on the other.[161] Further attempts to suggest three-quarter views of the face appear on vases usually dated from the second decade of the fifth century B.C., mainly bearded figures.[162] The only known female is slightly later (Sappho:**V133**),[163] and its preliminary sketch reflects the difficulty encountered by the vase-painter in order to achieve a naturalistic rendering of the facial features seen in a three-quarter view. The vase-painter tried to indicate correctly the position of every feature, but had to correct and re-correct the sketch; and the lips of Sappho are filled with numerous sketch lines, placed one over the other while he tried to draw the accurate shape and position of the mouth.[164] Because of the difficulty of drawing the head in three-quarter view, painters did not achieve a true oblique view yet: they combine multiple points of view to represent the eyes, nose and mouth in an asymmetrical facial contour (the near-side being larger than the far-side). Ajax (**V167**) and a centaur (**V137**) (pl. 268, 2) turn their heads slightly; within a foreshortened facial contour, the near-side eye, nose and mouth are represented frontally, while the eye on the far-side has its outer corner open and conterminous with the facial

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[161]Beazley, "Kleophrades", *JHS* 30 (1910) 58; *e.g.* (**V93, V195**) (pl. 232, 1).

[162]Brigand:**V103** (pl. 240, 2) , centaur:**V137** (pl. 268, 2), warrior:**V167**.

[163]The attribution to the Brygos Painter is disputed: Beazley, a late work (*ARV*^{2} 385,228); Robertson, Dokimasia Painter, *AVPCA*, 118.

[164] See Boss, M., "Preliminary sketch on Attic red-figured vases of the early fifth century B.C.", *Athenian Painters and Potters: the Conference Proceedings*, eds. Oakley, J.H., Coulson, W.D.E., Palagia, O. (Oxford 1997) 350.

contour. Some other figures (**V103, V133**) (pl. 240, 2) seem more advanced in this unconventional view: the head is turned further to the side, the far-side eye and the nose are in profile, and the near-side eye in a three-quarter view.[165] At the same time, posterior three-quarter views of the head also occur. On an alabastron thought to be an early work of Onesimos (**V241**) (pl. 297, 2), and on another close to the Foundry Painter (**V119**) (pl. 258), part of the face is drawn on one side of the head seen from the back, while both ears are shown from behind and turning in the same direction. Beazley remarks that this unusual representation only occasionally appears in only twenty years later,[166] and become more common in late fifth century vases, on which an eye is added on the turned face seen from behind (*e.g.* on a pelike considered "near the Pronomos Painter").[167]

Beazley, and more recently Woodford, wonder if the heads in an anterior three-quarter view, which are limited to bearded warriors and wild men or centaurs, do not point to a common source of inspiration: a monumental painting in which a bearded face, probably that

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[165]Both vases are late works in the painters' production. For Sappho see *ARV*^{2} 385, 228, and for (**V103**): "the ear is of the later Kleophradean form [...], the pubes [...] golden spreading kind which is usual in Kleophrades' later vases", Beazley, *JHS* 30 (1910) 57-58. Also see, Korshak, "The three-quarter viewed face" *Acts of the Twelfth Congress of Classical Archaeology*, vol. 2 (Athens 1983) 124.

[166]*E.g.* on a fragmentary bell-crater attributed to the Niobid Painter, symposium: London, British Museum E509; *ARV*^{2} 602, 29; and on cup attributed to the Penthesilea Painter, the quarrel between Ajax and Odysseus: Ferrara, Museo Nazionale di Spina T.18C VP; *ARV*^{2} 882,35, and 1673; *Para* 428; *Add*^{2} 301; Robertson, *AVPCA*, fig. 168.

[167]Gigantomachy: Athens, National Museum 1333; *ARV*^{2} 1337,8. *Para* 481. *Add*^{2} 366; Boardman, *ARFVC*, fig. 326; Beazley, "The master of the Achilles amphora in the Vatican" *JHS* 34 (1914) 209, note 30.

of a centaur, might have also appeared, obliquely viewed.[168] Yet, the association of the newly introduced face in a three-quarter view with bearded figures may be explained by the difficulty of suggesting foreshortened facial features: while the earliest representations of faces in oblique view consist of minor changes to a frontal face, vase-painters probably preferred to experiment with a more difficult foreshortening on an already widely used frontal face-type, the bearded one (used for satyrs, komasts, warriors)[169] rather than on a newly introduced and not fully mastered, such as the beardless male and female head.

On early fifth century vases some further changes occur in the drawing of the near-frontal male trunk, usually on figures attributed to the Antiphon Painter. Muscles are not outlined in a combination of frontal and profile views, but rather convincingly suggested with their foreshortened forms (**V76, V227**) (pls. 193, 1; 292, 2). As Williams notes "the new chest form has enabled him [the Antiphon Painter] to foreshorten the pectorals, by drawing one pectoral line long and slowly curving and the other shorter and much more strongly curved...The hips are given the impression of an oblique pose by omitting the vertical line between the lower abdomen and the area of the iliac crest on one side... what is unexpected is the retention of the change of direction in the line bounding the lower edge of the abdomen caused by the iliac crest. The shoulders are also accented differently: the right and nearer

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[168]Beazley, *JHS* 30 (1910) 58, and for (**V137**) (pls. 267, 2-268) Woodford, S., "More light on old walls: the Theseus of the Centauromachy in the Theseion", *JHS* 94 (1974) 160. Monumental painting has been often thought the source of inspiration for the new poses and foreshortenings which appear in vase-painting: Shefton, *Hesperia* 31 (1962) 330-368; for the Theseion, Barron, J., "New lights on old walls: the mural of the Theseion" *JHS* 92 (1972) 20-45.

[169]Korshak, *FF*, 5-17.

shoulder is boldly marked, both below and above, whereas the left is unstressed."[170] Although Williams had paralleled these experiments with those of the sculptor of the east pediment of the temple of Aphaia in Aigina, who also emphasises the median line of the trunk and carves the boundaries of the muscles in smooth furrows that interlink the different areas, this does not demonstrate a direct influence of contemporary sculpture on the Antiphon Painter's work. The development of this rendering in both sculpture and vase-painting rather reflects a common interest in a more accurate rendering of the human body, the anatomy of which is gradually understood as a whole (see for the gradual understanding of the rotation of the torso, pl. 180).

v. Others

The growing interest in more lifelike poses is also reflected in the representation of some specific moments of action. Herakles shooting the bow appears on late sixth-century vases[171] and is often shown in profile (the torso in frontal view and the lower limbs in profile) (see fig. 2, 1).[172] On a few black- and red-figure vases,[173] the archer taking aim is shown with a frontal torso, a flexed weight-bearing profile leg, and an extended leg seen from the front with the foot extended and viewed from above (fig. 2, 3). This figure described by Beazley as "one of the programmatic figures of the new movement"[174] has been often considered an

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[170]Williams, *New Perspectives*, 295.

[171]*LIMC* IV, 1(1988) 735.

[172]*E.g.* the Andokides Painter, (**V157**).

[173]**V148, V127, V163, V215** (pls. 185, 1; 260, 1; 278, 1; 289, 2).

[174]*The Development of Attic black-figure* (Berkeley 1951) 76

Euphronian invention, copied by some contemporary black- and red-figure vase-painters.[175]

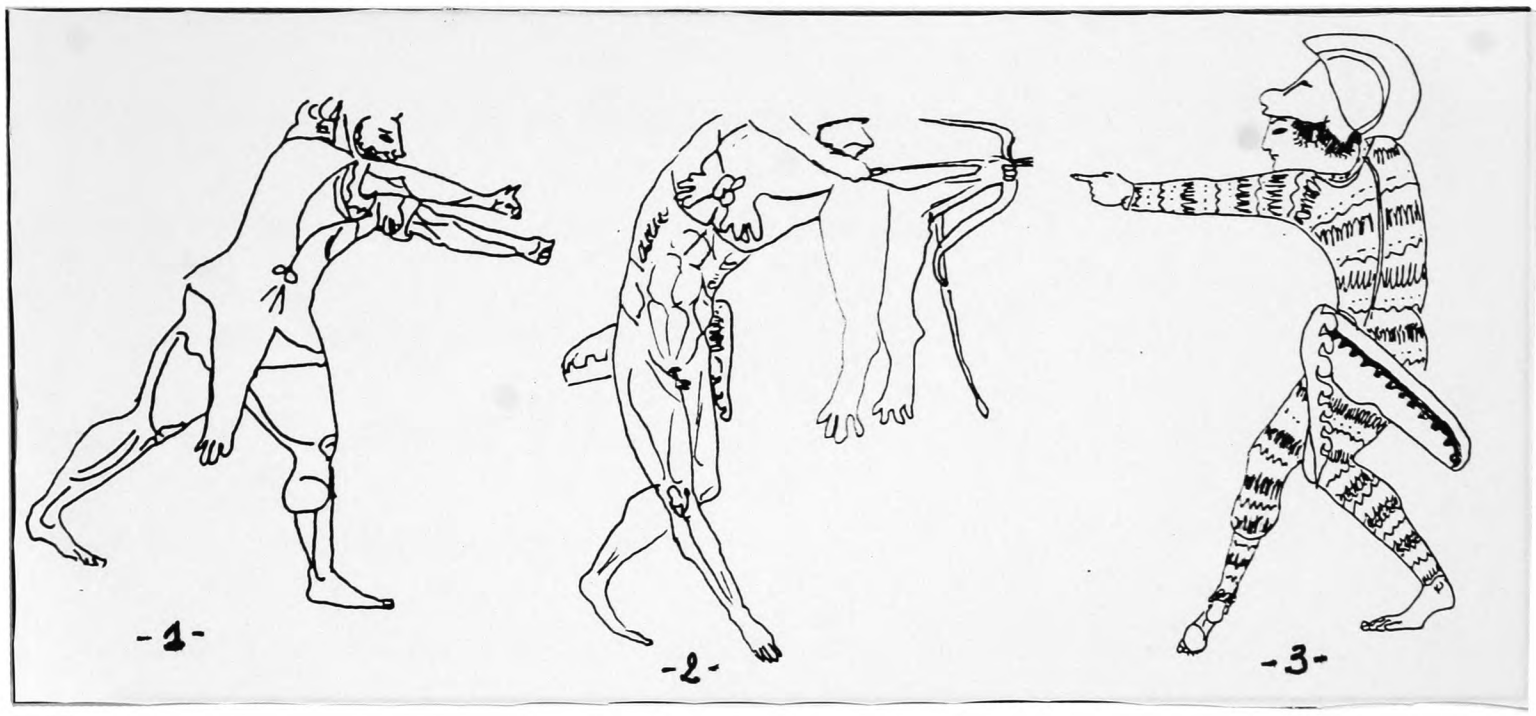

Fig. 2: 1. **V57**, 2. **V215**, 3. **V2**

Although it is difficult to demonstrate that a painter is responsible for developing an "original" pose, Euphronios and the other Pioneers seem to be interested in a careful portrayal of particular stances. On two vases,[176] also assigned to Euphronios, an Amazon is represented in a pose similar to that of Herakles, but from the back (fig. 2, 3). On these examples, the painter has not only adopted a new pose but also a new point of view. He has concealed the body in a patterned garment probably to minimize the difficulty of drawing a posterior view of the human figure in motion, but shows the elevation of the shoulder, defines the hip and buttock with one convex line, and draws the heel, arch and toes of the extended foot.[177] The drawing of all these features on the foot does not reproduce features which are visible when

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[175]Black-figure, Beazley, *Ibid.*; and Haspels, *ABL*, 41-46 (**V127**) (pl. 260). Oltos (**V48**) (pl. 185, 1), Cohen, *Bilingual Vases*, 383.

[176](**V2**) and Paris, Musée du Louvre G107, *ARV*^{2} 18,1; 1619; *Add*^{2} 153; see *Euphronios* (Paris 1990) no 19, 137-139.

[177]Kurtz, *Euphronios. Atti* (1992), 34.

the limb is shown in a similar pose, but makes easier the understanding of the pose.[178] It must be noted that this stance remains exceptional even on later vases, and the few figures which are shown in this stance occur in some Amazonomachy scenes, but are less naturalistically drawn, the torso in a posterior view combined with the lower limbs in profile.[179]

As regards another subject, the discobolus, who usually appears in profile on early red-figure vases,[180] Euphronios chooses to show this figure frontally raising the disc above the head, "at the most telling moment in the steps leading up to the throw".[181] As Villard pointed out: "l'attitude observée par le lanceur du disque n'est pas fréquente à cette époque dans l'art grec. ... L'athlète est montré en pleine action, une jambe ramenée en arrière, le bras droit tenant le disque, ... en train d'effectuer le mouvement de tournoiement... l'amphore d'Euphronios se place exactement à la transition entre la figure d'athlète encore statique du VIe siècle, qui se prépare seulement à lancer le disque, et les représentations du Ve siècle - instantanés saisis en

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[178]This stance, although less successfully drawn, can be found on one contemporary cup assigned to Oltos, Berlin, Staatliche Museen 2263, *ARV*^{2} 62, 85; 1622; *Add*^{2} 165; *LIMC* I, 2, (1981) pl. 448; the influence of Euphronios on this older painter has been already acknowledged see Williams, *Euphronios peintre* (1992) 79-84; but also the contrary, Johnson F.P., "Oltos and Euphronios", *The Art Bulletin*, 19 no 4 (1937) 559-560.

[179](**V109**) (pl. 251, 2) see Frel, "The Kleophrades Painter in Malibu" *J.Paul Getty M J* 4 (1977) 63-76; (**V202**) (pl. 287, 1), and for Amazons see *LIMC* I, (1981) 587-653, and for the Amazon drawing the bow, von Bothmer, *Amazons in Greek Art* (Oxford 1957) 136-138.

[180]Around the 520s, new scenes are introduced for athletics: training and new sports such jumpers, disc- and spear-throwing, see Gardiner, E.N., *Athletics of the Ancient World* (Oxford 1930) 53-58 and Villard, "Les athlétes d'Euphronios", *Euphronios peintre* (1992) 33-45.

[181]von Bothmer, *ibid.*, 29

pleine action".[182] This "momentary position, which cannot possibly be maintained and which is the most important movement of the throw",[183] must have inspired a figure by the Edinburgh Painter[184] and can be found again only a century later in vase-painting, on a Panathenaic black-figure amphora;[185] it is also represented on mid-fifth century coins from Cos.[186] Although their date is too late to suggest an influence from one medium to another, the similarity between both representations is striking. Another original moment of the disc throwing is depicted on a slightly later fragment assigned to Onesimos (**V241**) (pl. 297, 2): the athlete is shown from the back while he holds the disk with the arm extended laterally (in forced supination), at the moment before the conclusion of the swing.[187]

The fascination with the different poses and views of the human body is further illustrated by two jumpers (**V49**) assigned to Euthymides. Although rare, the youths shown in

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[182]Villard, "Fragments d'une amphore d'Euphronios au Musée du Louvre", *MonPiot* 47 (1953) 40-41.

[183]For a description of the discobolus' movement, see, Gardiner, "Throwing the diskos", *JHS* 27 (1907) 29-31.

[184]New York, Metropolitan Museum of Art 59.49.1, *CVA* New York 4, pl. 49, 4, the arm is less raised than that of Euphronios' athlete.

[185]Naples, Museo Archeologico Nazionale 86.333; *Le Sport dans la Grèce antique. Exhibition Catalogue* (Bruxelles 1992) no 159, 294-295.

[186]The earliest group was issued before 450 B.C.(because the Athenian decree forbiding allied coinage to the cities members of the Delian League); it has been dated to the second quarter of the fifth century by Baron, "The fifth-century discoboloi of Kos "*Essays in Greek Coinage presented to Stanley Robinson* (Oxford 1968) 75-88.

[187]The other known pose is a frontal view on a cup in Brussels, van Branteghem Collection, Hartwig, P., *Die griechischen Meisterschalen des Blüthezeit des strengen rotfigurigen Stiles* (Stuttgart 1893), 572-573, figs. 65b-c.

the act of jumping are not new, they appear on a Corinthian aryballos dated around the 580s,[188] and may also be seen in athletic scenes on some vases of the fifth century. What is original here, is that virtually the same figures are shown on both sides of the vase, from the front on one side and from the back on the other. The painter has drawn a single pose from different sides, a concept used later by the Kleophrades Painter[189] and the Painter of the Oxford Brygos Cup (**V161**), and which shows the interest in depicting different views of the human body.[190]

On early fifth century vases, other bolder foreshortenings are attempted, and show further interest in experiments with the third dimension and a spatial depth. Some have been listed by Williams who notes that "the first is on a remarkable fragment by Douris in Bryn Mawr on which a fallen warrior presents little more than the top of his head, his ears, probably his nose (now missing), his chin, the outline of his chest and one raised knee (**V56**) (pl. 187) ...The second is a particularly lively komos cup by the Brygos Painter in the British Museum (**V97A-B**) (pl. 235, 2) where we get a most unsavury view (the figure is shown crawling on all fours in a full back view). Finally on a damaged piece in Florence, probably by the Antiphon Painter, a komast is dancing with his head thrown back so that face becomes heavily foreshortened (**V65**) (pl. 189, 1)",[191] a pose similar to that on a fragment attributed by

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[188]Roebuck, M. C., "A prize aryballos", *Hesperia* 24 (1955) 158-163, pls. 63-64

[189]**V129, V240**.

[190]Robertson, "Jumpers", *Burlington Art Magazine* 129 (1977) 78-88; Links have been often suggested between Euthymides and the Kleophrades Painter, Richter, *AJA* 40 (136) 100-115; Beazley, *The Kleophrades Painter* 3-4.

[191]Williams, *New Perspectives*, 292.

True to the Kleophrades Painter (**V115**)[192] (pl. 256, 1).

CONCLUSION

Black-figure technique, with the use of incision for interior details, did not help the development of an accurate rendering of anatomical features and bodily poses, and although, from the last decades of the sixth century, some black-figure vase-painters attempt to similar experiments with those carried out in contemporary red-figure they were unable to suggest a naturalistic rendering of the human body in this technique. For a while, black-figure attempt to compete with red-figure and introduces its own stylistic developments, such as an increasing number of overlapping figures which enhance the impression of volume, mainly on large-scaled vases (**V82, V83**) (pls. 204; 208), or a "scenic space" with landscape elements (rocks, sea, trees)[193] and different levels of ground lines (often on lekythoi),[194] but from the early fifth century, the quality of this decoration declines from "dull to dreadful" and this technique is mainly limited to cups and lekythoi.[195] Although an important group of red-figure vases, mainly cups,[196] display figures in an almost abstract rendering and repetitive poses (**V120**) (pl.

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[192]True, *J Paul Getty M J* 14 (1986) 192 no 52.

[193]For the influence of the Near East in the development of landscape elements in black-figure, see Jackson, D.A., *East Greek Influence on Attic Vases, Society for the Promotion of Hellenic Studies, Suppl.* 12 (1976) 80-86.

[194]See Williams, *Looking at Greek Vases*, 108-111.

[195]Robertson, *AVPCA*, 38.

[196]Classified under the "Coarser Wing" chapter by Beazley, *ARV*^{2} 122-158.

259),[197] which reflect the lack of decorative skill of these craftsmen, also seen in the low quality of the shape, often small-scaled,[198] red-figure becomes the main technique in which skilled vase-painters work.[199] Its success may be explained by the possibilities it offers to vase-painters who are gradually interested in a more accurate rendering of the human body, while black-figure and the other newly-introduced techniques - coral-red, and white-ground - have their own limitations. Black-figure and coral red use incisions for the interior details, and white-ground, which may have allowed a rendering similar to that in red-figure and might have been close to monumental painting since it makes posssible a growing use of colours, cannot be widely applied on the interior surface of utilitarian shapes because of the nature of its white

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[197] The abstract rendering is often attributed to the Pithos Painter, see Beazley, *ARV*^{2} 139; "Excavations at Al Mina, Sueidia II, the red-figure vases", *JHS* 59 (1939) 3; more recently, Lissarague, F., *L'autre guerrier, archers, peltastes, cavaliers dans l'imagerie attique* (Rome 1990) 114-145.

[198] Villard, *Euphronios. Atti.* (1992) 25. Although it was occasionally suggested that these cups were specially produced for the Near East because a significant number of them was found in this area (Brommer, F., "Themenwahl aus örtlichen Gründuen" *Ancient Greek and related Pottery*, ed. Brijder, H. A.G. (Amsterdam 1984) 178-184; and Villard wonders if "la très large diffusion des coupes produites dans l'atelier où travaillait le Peintre de Pithos n'est-elle pas le signe d'un début de changement d'orientation du marché qui, pour les vases à figures rouges au moins, était jusque là essentiellement orienté vers l'Etrurie ?", *Euphronios. Atti* (1992) 27, note 30.), this cannot be accepted since a few examples were also found in other places: *e.g.* from Gela, Syracuse, Museo Archeologico Nazionale 19820, *ARV*^{2} 139, 16; and *ARV*^{2} 140, 31-34; some from Athens, Athens, Agora Museum P 16821, *ARV*^{2} 139, 17, Agora Museum P 2579, *ARV*^{2} 139, 18, Agora Museum P 2800, *ARV*^{2} 140, 37; from Corinth, Athens, National Musuem 12268, *ARV*^{2} 140, 36. See also, Lissarague F., "Voyages d'images" iconographie et aires culturelles" *REA* 89 (1987) 261-269.

[199] They may also occasionally decorate black-figure panathenaic amphorae (*e.g.* the Berlin Painter, **V143**, and for the Kleophrades Painter, see Matheson, S.B., "Panathenaic amphorae by the Kleophrades Painter', *GV J Paul Getty M* 4 (1989) 95-112), and white-ground (*e.g.* Onesimos, see Sparkes, "Aspects of Onesimos, *Archaic*, 20).

slip.[200]

In red-figure vase-painters show a deepened interest in anatomy. They note anatomical features in detail, draw them in a form close to their natural one (not in a decorative pattern), and from the early fifth century, they shape muscles in simpler forms which reflect a better understanding of the body as a whole. Painters also use the possibilites offered by the red-figure technique to distinguish between muscles projecting a strong and soft shadow by outlining them in a relief or dilute line, and suggest shadow either with dilute wash applied in the hollows of abdominal divisions on a few large-scale males (usually attributed to Euphronios), or with hatched glaze. They also occasionally experiment with the rendering of facial emotion and draw anatomical features which are different from the common type in order to single some figures out by outlining their age, or some distinctive anatomical details such as a bald forehead, a hooked nose, doubled chin and fat body. Even if these experiments do not reproduce the wide range of feelings which may be seen in life and an individual likeness, they move away from the conventional representations which limit the rendering of emotion to codified gestures and the identity of the figures to types recognized by their attributes: red-figure vase-painters suggest emotion or the distinctive appearance of a figure through the rendering of anatomical features.

As in sculpture, in vase-painting the development of lifelike poses may be related to that of a more accurate rendering of human anatomy. While figures in action were already portrayed in new poses on red-figure vases dating from the last decades of the sixth century,

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[200]See Mertens, J., *Attic White-ground. Its Development on Shapes other than Lekythoi* (New York & London 1977) 223.

they are depicted in anatomically impossible combinations. As long as vase-painters did not solve the problems of disposing the body in space and did not acquire the anatomical knowledge necessary to understand the body as a whole, they are selective and conceive the human figure in separate parts that may be shown according to different points of views.[201] From the early fifth century, the number of lifelike poses increases significantly, and along with the growing anatomical knowledge, vase-painters render with greater anatomical accuracy the body in motion or at rest, and the flexion or extension of the muscles. The close observation of the human figure in action is further reflected in the new attitudes introduced by vase-painters which seem to be stem from everyday life[202] - komasts not only vomit but also urinate, revellers have sexual intercourse,[203] wrestlers forget the rules and gouge out the eye of their opponents,[204] and athletes are shown folding their cloths or removing a splinter from their foot.

Nonetheless, progress towards anatomical naturalism and lifelike poses is slow, and naturalism is not completely achieved. In the rendering of anatomy, the lateral and medial

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[201] Kielland, *The Human Figure*, 22.

[202] For these scenes see Himmelmann, N., *Realistischen Themen in der griechischen Kunst der archaischen und klassischen Zeit* (Berlin & New York 1994).

[203] Dentzer notes about the new scenes taking part in the symposium: "Tout se passe comme si la clientèle des peintres avait changé, comme si la composition même de la société athénienne avait évolué. Cette évolution s'explique bien si le banquet est un privilège à l'origine de l'aristocratie terrienne limitée, et se diffuse ensuite dans un milieu social plus large, plus ouvert, plus urbain, ... dans ces conditions, on comprend mieux le caractère plus intime, plus détendu" (*Le motif du banquet couché dans le Proche-Orient et le monde grec du VIIe au Ive siècle avant J.-C.* (Rome 1982) 125-126).

[204] A few of these scenes appear on vases assigned to the Foundry and Antiphon Painters, see Beazley, "A Greek realist" *Greek Vases.Lectures by J.D. Beazley*, 78-83.

aspects of the muscles are barely distinguished, while some anatomical features may even be depicted in the wrong places (*e.g.* ribs drawn twice on the same torso, once on the flank, once on the abdomen, and hamstrings on the thigh). These "mistakes" may be explained by the importance of outline in vase decoration. After sketch-lines were drawn, figures were outlined with a broad contour that served as a guard against overlapping while painting the black background.[205] Thus, the outline of the figure was the first stage of drawing, and even if the vase-painter had closely studied the musculature, the human figure was first a silhouette, and its inner features, the rendering of which could be quite naturalistic, remain filling patterns that may be displayed in the wrong places. The oblique views of the head and body seem also difficult to achieve. The head in a three-quarter view is introduced only in the first decades of the fifth century probably because it was difficult to draw foreshortened facial features, such as the eyes, the nose, and mouth. For this reason, small deviations from a strictly frontal face suggest initially a slight turn of the head, while foreshortened features are only gradually outlined (the eye on the far-side drawn in profile, open and coterminous with the facial contour, the nose in profile, and the mouth foreshortened, see Sappho: **V133**) the three-quarter anterior or posterior views of the body are suggested in a combination of frontal and profile views of the limbs and inner anatomical markings, which, although effectively conveying a lifelike image, is an impossible anatomical combination.

Following the descriptions provided by ancient sources about monumental painting, a few scholars wonder whether the experiments in vase-painting were not influenced by those

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[205]Noble, *Technique*, 51-52

which were carried out in free painting, and whether the use of shading,[206] "details of unusual realism" (such as hair under the arms and three-quarter and back views of the head and body),[207] the limited number of lifelike poses which are repeated within a vase-painter's repertoire, or copied by others, less skilful, craftsmen,[208] did not reflect the influence of a monumental painting.[209] Yet, it is difficult to demonstrate direct inspiration from wall-paintings since ancient sources provide us with little information, and attribute experiments, which may be paralleled with those seen in early red-figure, such as the development of foreshortened views (to Kimon of Kleonai), of motion and emotion (to Kimon of Kleonai and Polygnotos of Thasos), to painters active mainly after the Persian Wars.[210]

Early red-figure vase-painters did not have to copy Archaic painting since both techniques were based on draughtmanship and offer similar possibilities for the experiments with a more accurate rendering of the human figure. Ancient texts praise painters older or contemporary with Polygnotos of Thasos for the quality of their lines and draughtmanship,[211]

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[206]Robertson, *HGA*, 239.

[207]Beazley, *JHS* 30 (1910) 58-59; Woodford, *JHS* 94 (1974) 158-165.

[208]For example, the revellers drawn by Euphronios (**V138**) (pl. 269) and Smikros (**V51**) (pl. 186, 1). A few scholars also imply the existence of "sketch-books" (on sherds, or even small sculptures): Tiverios, M., *Προβλήματα της μελανόμορφης Αττικής κεραμικής* (Thessaloniki 1981) 134-150; Schauenburg, K., "Zu Repliken in der Vasenmalerei" *AA* (1977) 194-204; and more recently about this question, Boardman, J., "Sixth century potters and painters", *Looking at Greek Vases* (Cambridge 1992)100-101

[209]Woodford, *JHS* 94 (1974) 158-165, and with more caution, Cohen, "Paragone: sculpture versus painting, Kaineus and the Kleophrades Painter", *Ancient Greek Art and Iconography*, 171-180.

[210] See, III. Ancient Sources, i. 37.

[211] D.H., *Is.* 4: Εἰσὶ δὴ τινες ἀρχαῖαι γραφαί μὲν εἰργασμέναι ἁπλῶς, ...

and define their paintings as outlines (*omnes umbra hominis lineis circumducta*),[212] progressively filled either with pure - unmixed - colours (*secundam singulis coloribus et monochromaton dictam*)[213] or with inner details also drawn in outline (*sine ullo etiamnum hi colore, iam tamen spargentes linias intus*).[214] As Beazley writes, "the vase-painter often does work which will stand comparison with the best done by workers in other mediums, and which cannot have come short of contemporary painting on wall, or wood, or marble; ... as long as painting meant line-drawing coloured in, so long the vase-painter felt himself the painter's brother...". [215]

A few skilled vase-painters also show a personal quest towards a more accurate rendering of the human body which excludes an influence from another medium. Among them, Euphronios, who provides us with surviving vases signed as a painter, and who gradually develops an exhaustive treatment of musculature, develops lifelike poses, facial emotion and introduces distinctive anatomical feature baldness, and wrinkles, may be used as the best example. In his preliminary sketch, he occasionally makes changes in his own design to achieve

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ἀκριβεῖς δὲ ταῖς γραμμαῖς, καὶ πολὺ τὸ χαρίεν ἐν ταύταις ἔξουσαι. αἱ δὲ μετ' ἐκείνας, εὔγραμμοι μὲν ηττον. Although these ἀρχαῖαι γραφαί have been usually associated with the paintings of Polygnotos because of his acknowledged use of unmixed colours (Quint., *Inst.* 12.10.3), the praise of draughtmanship may be also extended to earlier painters, who also probably used unmixed colours.

[212]Plin., *HN* 35. 15.

[213]Plin., *HN* 35. 15.

[214]Plin., *HN* 35. 16.

[215]*VAM*, 142. The close link between the technique of the vase- and wall-painter is illustrated in Etruria, where a few workshops specializing in wall-painting were developed in areas with an old vase-painting tradition, see Rouveret, *Histoire et imaginaire*, 19, note 19.

a more expressive attitude and lifelike pose: for instance, on the Louvre crater (**V188**), he first draws Antaios with his right arm flexed and supporting the rest of the body in a traditionnal and not expressive gesture, while in the final version the arm is extended and lying in a powerless attitude.[216] His personal progress in the rendering of lifelike poses and an accurate anatomy may be further illustrated by the comparison between two vases, signed by him, which depict the same subject, the death of Sarpedon. On **V154** (pl. 277, 1), which is earlier than (**V152**) since a full use of relief line is still made on it, the painter portrays the dead Sarpedon with the arm extended and crooked around the head in the conventional "dead" gesture, and draws without accuracy the abdominal divisions and the muscles of the upper and lower limbs. On **V152** (pl. 275, 2), he shows the hero in an expressive and more lifelike pose (even if he still encounters difficulties in the leg shown in a three-quarter view), develops a more accurate rendering of the muscles of the abdomen and the upper and lower limbs (although still decorative, and with anatomical mistakes in the rendering of the near-side arm in demi-pronation), and adds details in the face to enhance the expression.

Euphronios' personal concern with naturalism in the rendering of the human body is further confirmed by the fact that he favours a specific range of shapes which allow him to draw large-scaled figures which makes it easier to add anatomical details and to experiment with lifelike poses. "He likes big craters",[217] and seems to be the first among early red-figure

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[216]*Euphronios* (1990), 72, n. 3: "...son bras droit disloqué dont la main, insensible, repose par terre entr'ouverte était, dans une première version moins suggestive que l'on peut lire à travers l'esquisse, replié devant le genou d'Hérakles, et servait au géant de point d'appui."

[217]Boardman , *ARFVAP*, 32.

vase-painters to make frequent use of the calyx-crater,[218] and to transform the old black-figure shape introduced by Exekias to a larger one.[219] As Robertson points out " the most important feature of this shape [the calyx-crater] from the decorator's point of view is the straight wall .... this wall offers a particularly good field for figure-compositions".[220] In fact, the wall of the calyx-craters decorated by Euphronios usually displays an almost straight profile avoiding the curve seen on earlier craters and other shapes, and thus provides a decorative surface close to that of a panel-painting. This feature may explain why most of his successful compositions appear on this shape. The preference of Euphronios for large surfaces may be further seen in the decoration of the Arezzo volute-crater (**V2**). While the earlier examples of this shape are decorated either with frieze upon frieze of small figures on the neck, body, foot and handles (like the François Vase),[221] or with small figures confined to the lower register of the neck;[222] Euphronios developed large scale composition on the body.[223] This surface allows him to depict an Amazonomachy in which the fighters sometimes display bold foreshortenings. From

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[218]The first known red-figure calyx-crater has been assigned to Psiax, Paris, Musée du Louvre CA 5960; see *Euphronios* (1990) no 59, 229-233.

[219]For a comparison between the calyx-craters of Exekias, and Euphronios, see Frank, S., *Attische Kelchkratere. Ein Untersuchung zum Zusammenspiel von Gefässform und Bemalung* (Frankfurt am Main 1990), Exekias: 23-27; Euphronios: 89-103.

[220]Robertson, *AVPCA*, 23.

[221]Florence, Museo Archeologico Etrusco 4209, *ABV* 76,1; *Para* 29; *Add*^{2} 21; see Boardman, *ARFVAP*, figs. 46, 1-7.

[222]For the decoration of black-figure volute-craters see Hitzl, K., *Die Entstehung und Entwicklung des Volutenkraters von den frühesten Anfängen bis zur Ansprägung des komonischen Stils in der Attisch Scwarzfigurigen Vasenmalerei* (Frankfurt am Main 1982) 20-24 and 111-115.

[223]Some scholars considered Euphronios as the inventor of the decoration on the body of the volute-crater, see Paribeni, E., "Note sul cratere a volute", *Euphronios. Atti* (1992) 19;

this point on, the figured-decoration on the body of volute-craters becomes the vehicle for large figure compositions especially around the second quarter of the fifth century.[224] While he decorated cups of type B, these are shaped with a shallow bowl (usually by Cachrylion) which provides a more suitable surface for his large-scaled figures and complex scenes. As regards the cups, Villard explains the association of Euphronios with the potter Cachrylion rather than with Euxitheos (usually associated with Euphronios for large calyx-craters) because "la coupe d'Euxithéos, également de type B a, en dépit de ses dimensions exceptionnelles, une vasque en proportion plus courte, plus ramassée, un pied relativement épais, ce qui par conséquent laisse moins de possibilité à des compositions figurées plus larges, plus complexes, de type nouveau."[225]

It seems, therefore, clear that experiments with a more accurate rendering of the human body were carried out in the sphere of pottery-making itself without relying on those which were developed in other contemporary media. A vase-painter, such as Euphronios, who is generally acknowledged to focus on human antomy and to introduce lifelike poses, shows his personal quest towards naturalism in his preliminary sketch, and in his association with specific shapes and iconographical subjects which increase the possibilities for these experiments.

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and Kurtz, *Euphronios. Atti* (1992), 31

[224]*E.g.* The Altamura Painter, Gigantomachy: London, British Museum E469; *ARV*^{2} 589,1; *Add*^{2} 264. Painter of Bologna 279, Amazonomachy: Ferrara, Museo Archeologico Nazionale di Spina 3031; *ARV*^{2} 612, 1; 249; 1662; *Para* 397; *Add*^{2} 268

[225]Villard F., "Euphronios vers 500", *Euphronios. Atti* (1992), 24.

VI. CONCLUSION

The extant literary sources credit some artists, in the years following the Persian Wars, with experiments which reflect a growing interest in a more naturalistic rendering of the human figure. Despite the emphasis laid on them by ancient texts, the archaeological material found in Attica, which is larger than that preserved in antiquity after the Persians' sack of the city,[1] attests earlier, from around the last quarter of the sixth century, a similar concern in all media and the introduction of new techniques such as the piece-casting process in large-scale bronzes and the red-figure in vase-painting, which provide further opportunities for the development of this interest in *mimesis*.[2]

During this period, human anatomy is gradually shaped with greater accuracy and the body represented in lifelike poses in both sculpture and vase-painting. From the early fifth century, the growing interest in human anatomy leads to a deeper understanding of the human body as a whole, and the interrelation between muscles is gradually rendered in all media. In marble and bronze sculpture, anatomical features are carved or cast without stark contours and pass smoothly from one to the other. In red-figure vase-painting linear devices are used to achieve a similar effect: muscles are occasionally drawn in open rather than in closed patterns in order to minimize the boundaries, and this drawing integrates the anatomical features as a unified whole and enhances the illusion of volume determined by underlying bones and

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[1]For the destruction of Athens and its suburbs, see Hdt. 8. 50. 6-7, and that of the Acropolis, Hdt. 8. 53. 14.

[2]For the specific development of small-scale, mass-produced terracota figurines which does not reflect a similar concern with naturalism, see IV. Conclusion, 155.

muscles.[3] Although a significant number of figures in motion occur from the last decades of the sixth century, it was only from the turn of the century, that accurate lifelike poses were achieved in both sculpture and vase-painting. As soon as sculptors and vase-painters understood how the anatomical features are related each to the other, and outline the changing shape of contracted and extended muscles, bodily poses are suggested with a growing anatomical accuracy.

Ancient sources relate the growing interest in the rendering of emotion and individualized anatomical features with the development of a naturalistic representation of the human body since they usually attribute all these features to the same artist: Polygnotos was interested in motion, emotion and in the rendering of portraits; Pythagoras of Rhegion in *pathos* and *rhythmos*, and developed a more accurate rendering of some anatomical details. Material evidence confirms this relation: the interest in the rendering of emotion and of some distinctive anatomical features which do not follow an idealised shape, appears at about the same time as the development of a more accurate rendering of anatomy. In fact, both features depend both on the artist's interest in reproducing the actual appearance of a life model and on his ability of rendering anatomical features in accurate forms since facial emotion is marked by the contraction and extension of the facial muscles and individual likeness by the rendering of anatomical features in shapes which reproduce those of the model. Ancient sources mention a growing number of sculptures and paintings, from the years following the Persian wars, which portray famous contemporary individuals, and praised them for their likeness (*similitudo*) with the model, but the extant Roman copies of Greek originals and some figures in vase-

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[3]For the attribution of this development to the Antiphon Painter see Williams, *New*

painting have facial features which deviate only slightly from the common type and which, in any case, are not individualized features. In fact, although artists show a gradual interest in the *mimesis* (in an accurate rendering of anatomy, in lifelike poses, and occasionally in facial emotion), they usually exclude the irregularity of natural forms (to which also belong the individualized features) and suggest a symmetrical and well-proportioned anatomy.

A slighty different pace of development towards naturalism may be noted between the media (marbles, bronzes, vases). According to the extant material, vase-painters seem to have experimented with a greater number of lifelike poses, and to have introduced a wider range of facial emotions and distinctive anatomical features, earlier than contemporary sculptors (marble sculptors and bronze-makers). It is clear that the red-figure technique, which is close to draughtmanship, offers a greater freedom in the rendering of lifelike poses than sculpture in marble or large-scale bronze casting in its early stage: marble sculptors deal with a material which may break and, therefore, have to use a clay model when carving a body in violent motion, while bronze-makers, despite the tensile strength of their medium, had to master the piece-casting technique in order to cast statues in action.[4] Yet, technique alone cannot be the sole explanation since sculptors and bronze-makers show an anatomical knowledge similar to that of the vase-painters in their rendering of the human body. They are, therefore, able to experiment with facial emotion and distinctive anatomical features in a similar manner to vase-painters, since the rendering of these features does not encounter the technical difficulties

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Perspectives, 295-296.

[4]See more recently about the technique: "... sculpture is a slower, more intractable medium that lends less readily to rapid experimentation than does vase-painting...", Pollitt, "Art: Archaic to Classical", *CAH* 5 (1992), 173.

which applied to the rendering of poses. It is likely that the function of the object, its cost, and the iconographical subject may also have played a part in the development of these experiments. In vase-painting, facial emotion and distinctive anatomical features occur mainly on figures which take part in either newly treated scenes of well-known mythical stories or newly developed genre scenes. Vase-painters who decorate primarily utilitarian vessels, enjoy a greater freedom of choice in the subject-matter than sculptors, and develop scenes with emotionally charged figures or portray everyday experiences, which enable them to carry out innovations in the conventional rendering of the human figure.[5] On the other hand, sculptors were probably more bound to a conventional form of representation, because of the cost of the material (marble or bronze) and the formal or religious function attached to their medium, which is usually comissioned either by the city or a wealthy family as votive dedication, decoration for an important building, or a funerary commemoration.

Despite these differences and the limitations in the naturalistic representation of the human body, the experiments which are carried out throughout the years 525-480 and which were studied in this thesis show that sculptors and vase-painters were interested in a more accurate rendering of anatomy. From this period, they change their way of looking at their principal model, the human figure, which they observe closely in order to acquire a better knowledge of its anatomy.

This move away from the conventional manner of rendering the human body in art

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[5]According to Ridgway, vase-painters may have led stylistically because the greater demand of figured vases allowed for greater practice and therefore for more rapid stylistic development (Ridgway, B. S., "Late Archaic sculpture", *Archaic* (1985) 3). This explanation alone cannot be valid since other objects, such as the terracottas, also mass-produced, did not display similar experiments.

coincides with the emphasis laid by contemporary philosophers and physicians on features which distinguish humans from other creatures (animals and gods).[6] Although the extant texts of early Greek physicians are dated to the second quarter of the fifth century,[7] the rising concern with human characteristics may be traced back to the philosophical writings of Xenophanes of Kolophon, a contemporary of the late sixth century artists. As far as is known, Xenophanes is the first, to regard the use of hands as a distinctively human feature,[8] and to relate the degree of human knowledge to human perception.[9] He also provides us with the earliest evidence of an interest in anatomical features which may help to distinguish human races.[10] It is likely that physicians contemporary with Xenophanes, such as Demokedes of

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[6]The relation between art and medical texts was already suggested for fifth-century sculpture and writings by Metraux who, however, limited his study to some marbles dated to the second quarter of the fifth century, and he, unconvincingly, attempts to relate specific philosophical theories on the soul, respiration and blood with the contemporary rendering of the human body, see *Sculptors and Physicians*, 91.

[7]A list of anatomical features which distinguish humanity from animals is provided by Aristotle, see Lloyd, "The development of zoological taxonomy. 3. Man as a model", *Science, Folklore and Ideology*, 26-44, and this practice was traced back to Anaxagoras by Metraux, *Sculptors and Physicians*, 91.

[8]F 15 (Lesher), [=Clement, *Miscellanies* 5. 10]: εἰ -δέν- τοι -ἵπποι- ἔχον χέρας ἢ βόες ἢ λέοντες// ἢ γράψαι χείρεσσι καὶ ἔργα τελεῖν ἅπερ ἄνδρες... (but if horses or oxens or lions had hands or could draw with their hands and accomplish such works as men ...).

[9]F34 (Lesher) [=Sext. Empricus, *Against the Professors*, 7. 49]: καὶ τὸ μὲν οὖν σαφὲς οὔτις ἀνὴρ ἴδεν οὐδέ τις ἔσται// εἰδὼς ἀμφὶ θεῶν τε καὶ ἅσσα λέγω περὶ πάντων... (..and of course, the clear and certain truth no man has seen it, nor will be anyone who knows about gods and what I say about all things...) and F38 (Lesher) [=Herodian 41. 5] which outlines that the judgements men make about the qualities of physical substances are to some extent a function of the perceptual experiences they have had, see Lesher, *Xenophanes*, 180.

[10]F16 (Lesher) [=Clement, *Miscellanies*, 7. 22]: Αἰθίοπες τε -θεοὺς σφετέρους- σιμοὺς μέλανάς τε.// Θρῆκες τε γλαυκοὺς καὶ πυρρούς -φασι πελέσθαι- (Ethiopians say that their gods are snub-nose and black. Thracians that theirs are blue-eyed and red-haired). This passage has been also considered as an evidence of Xenophanes'

Kroton, were aware of these theories and transmitted them to the following generation. A Xenophanic influence is further attested in some fragments assigned to Alkmaeon and Empedokles, which display a close correspondance in thought and terminology with those of Xenophanes.[11]

It is possible to demonstrate that Athenian artists and artisans were aware of these philosophical and medical trends, which probably influenced their growing interest in the human body.[12] Although these physicians and philosophers were not native Athenians their theories were known in Athens. We are told that Demokedes of Kroton and Anaxagoras of Klazomenae lived there for a while and were praised by the city and its rulers.[13] Scholars have noted that the work of Xenophanes of Kolophon was known to Euripides, who lived almost a century later, and who echoes his comments on the topics of divine majesty and excessive honours accorded to athletes.[14] The use of Xenophanes' comments by Euripides further suggests that the latter's audience showed interest in philosophical writings, which is also confirmed by Aeschylus' plays in which the tragedian adopts some of Anaxagoras'

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willingness to learn first-hand about lands and people ("Ethiopians said..."), see Lesher, *Xenophanes*, 91.

[11]For Alkmaeon, F34 of Xenophanes (Lesher) [=Sext. Empiricus, *Against the Professors*, 7. 49] and 24 B 1 of Alkmaeon (Diels-Kranz) [=Thphr., *Sens.* 25-26], see Fränkel, *Early Greek Poetry and Philosophy*, 340, and 21B23 (Diels-Kranz) of Xenophanes with F98 (Bollack) [Hippolyte, Ref. 7. 29. 13] of Empedokles (against the latter comparison, see Bollack, *Empedocle*, vol. 3, 1, 141).

[12]It was legitimately wondered to what an extent artisans could be aware of these currents, See Ridgway, *Archaic* (1985) 3.

[13]According to Herodotus, Demokedes of Kroton practised in Aegina for a year, made a great reputation and was hired by the city of Athens, which was under Peisistratid rule, Hdt. 3. 131. Although Anaxagoras'chronology is confused, we know that he reside in Athens, and was associated with Perikles, D.L. 2. 12; Isocr. 15. 235; D.S. 12. 39.

[14]Lesher, *Xenophanes*, 6.

geographical and physiological views.[15] Similarly, from the time of the *Iliad* and the *Odyssey* to that of Aeschylus' plays and Herodotus' writings, literary testimonia point to the layman's concern with human anatomy, physiology and medicine, since they provide significant descriptions of anatomical features, internal organs and bones. This literature is not directed only at literate and well-educated Athenians whom, we are told, studied medicine as part of their education,[16] but also at a larger audience which probably included sculptors and other craftsmen. Lyrical contests and Homeric recitations were held in Athenian festivals,[17] there was unrestricted access to theatrical performances,[18] and Athenians could also attend various public readings, such as the ones Herodotus reputedly gave of his *Histories.*[19]

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[15]In the *Supp.* 559-561 (*ca.* 463), and in a fragment (F 193 Mette), Aeschylus adopts the view of the cause of the summer flooding of the Nile which our sources attribute to Anaxagoras F42 (Lonza) [=Hippol., *Refut.* 1. 85], and in the *Eum.* 657-666, he restricts the function of the womb to a place in which the father's seed may grow, a theory ascribed to Anaxagoras, F 107 (Lonza) [=Ar., *Ga.* 4. 1. 763b 30-3].

[16]Aristotle mentions medicine as part of liberal education, Ar., *Pol.* 3. 6, 1282a

[17]On musical performances, competitions and Homeric recitations at the Panathenaia under the Tyrants, see Shapiro, H. A., *Art and Cult under the Tyrants in Athens* (Mainz am Rhein 1989) 41-47.

[18]The state-subsidized performances at the Panathenaic festival and the festival of Dionysus exposed the average citizen to poetry, music and dance, see J., Ober, *Mass and Elite in Democratic Athens, Rhetoric, Ideology, and the Power of the People*, (Princeton 1990)^2, 152, 158. An introduction of payment must be dated soon after the democratic restoration in Athens, and the state underwrote the price of dramatic festival admisions by the creation of a theoric fund was created by the mid-fourth century, see Rhodes, P. J., *A Commentary on the Aristotelian Athenaion Politeia*, (Oxford 1993), 492, 514, with further bibliography. More specifically about dramatic performances under the Peisistratids, Shapiro, H. A., *Art and Cult under the Tyrants* (Mainz am Rhein 1989) 86.

[19]Euseb., *Canon.*, Olympiad 83, 4 (445-444): "Herodotus cum Athenis libros suos legisset honoratus est"(Herodotus read in Athens from his books and received honours). For a critical review of Herodotus' public readings at Athens, Podlecki A. J., "Herodotus in Athens ?" *Greece and the Eastern Mediterranean in Ancient History and Prehistory. Studies to F. Schachermeyr* (Berlin 1977) 47; and Thomas, R., *Literacy and Orality in ancient Greece* (Cambridge 1992) 4.

Laymen were also directly acquainted with medical and philosophical theories through the public lectures given by physicians. According to Plato, a physician hired by the city had to compete with several doctors publicly to convince the people of his skills.[20] Public lectures given by a physician are also mentioned in a Hellenistic decree, dated to the second century, which honors him.[21] A passage in Herodotus infers that a similar practice applied to physicians working in the last decades of the sixth century.[22] The historian reports that Demokedes of Kroton, who became a public physician in Aigina, Athens, and Samos (he was hired by the tyrants of these cities), surpassed the other physicians without the use of specialised material (ἀσκευής) and instruments (οὐδὲν τῶν ὅσα περὶ τέχνην ἐστὶ ἐργαλήια).[23] This information may suggest that he managed to defeat his fellow "craftsmen" in a public lecture, since Herodotus also tells us that he "spoke" (ὡμίλησε) to Polykrates, tyrant of Samos, who subseqently employed him. In fact, the social position of a doctor, as a craftsman, implies that he had to convince people, his future patients, of his *techne* or healing skill.[24] Although it is clear that there was a broad stratum between the "best in the crafts", whose ideas are reflected in literature and the mere practitioner mainly who was bound to

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[20]Plat., *Gorg.* 455-456B, 514D-E; and allusions in Xen., *Mem.* 4.2.5

[21]From Perge, *Mon. Ant.* 23 (1914) no 48.

[22]Hdt. 3. 131.

[23]*Ibid.* ὑπερεβάλετο τοὺς ἄλλους ἰητρούς, ἀσκευής περ ἐὼν καὶ ἔχων οὐδὲν τῶν ὅσα περὶ τέχνην ἐστὶ ἐργαλήια.

[24]On the history of the social status of early Greek physician, see Edelstein, L., "The Hippocratic physician", *Ancient Medicine*,[2] 87-110, and more recently Kudlien, F. "Überlegungen zu einer Sozialgeschichte des fruhgriechischen Arztes und seines Beruf", *Hermes* 114 (1986) 129-146. For other features which may help defining the medical *techne* see, Lloyd, G. E. R., "The definition, status and methods of the medical τέχνη in the fifth and fourth centuries", *Science and Philosophy in Classical Greece*, ed. by A.C. Bowen (New York & London 1991) 249-260.

tradition and to the healing practice, the latter could not be entirely unaffected by philosphical theories since he needed them to explain diseases to patients and to convince them of the efficacy of his treatments.[25] It is therefore likely that philosophical and medical theories were also transmitted orally to Athenians by public lectures, which took place in the Gymnasium[26] or in the Assembly,[27] as attested by slightly later texts. Although human dissection was not practised by contemporary physicians, their growing interest in some anatomical features and internal organs which were considered to be typical of the human being might have influenced sculptors and painters to look closely to the human body and its anatomy.

It would have been useful to examine material evidence from the places where the known physicians and philosophers come from - Kolophon, Klazomenae, Kroton, and Agrigento - in order to discover if they had a more accurate rendering of the human figure. Unfortunately, very little material dating form the last decades of the sixth century is known. For Kolophon, there is no record of any local school of artists, and it was only possible to attribute to Klazomenae the Klazomenian sarcophagoi and some sculptures of the sixth century.[28]In addition, artistic activity seems to decrease significantly in these regions because

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[25]See Temkin, O. "Greek medicine as science and craft", *Isis* 44 (1953), 225.

[26]Hellenistic inscription form Perge, *Mon. Ant.* 23 (1914) no 48, and Plato who suggests a further link between the gymnasium and the physician, by ascribing the development of dietetic medicine to a former gymnastic trainer who turned into a physician, *Republic* 3. 14; 406 E.

[27]Plat., *Gorg.* 455B-456B.

[28] See Hiller, H., *Ionische Grabreliefs der ersten Häfte des 5. Jahrhunderts v. Chr.* (Tübingen 1975) 35; and Tüchelt, K., *Die archaishen Skulpturen aus Didyma, Beiträge zur frühgriechischen Plastik in Kleinasien* (Berlin 1970), 181. Despite the little material evidence from Klazomenae, Croissant attempts to reconstruct the regional style (from the paintings on the sarcophagoi and some terracotta figurines) and demonstrate its influence on that of late-sixth century Athens, *Protomés*, 166-177; cautiously followed by Boardman, J., "Culture and

of the Persian threat and the growing number of Ionian emigrants who flee to mainland and Western Greece. In Western Greece, Kroton which was famous for its physicians and philosophers, and which may have had its own artistic tradition since an Archaic sculptor from this city is mentioned by Pausanias,[29] provides only a few mass-praduced terracotta figurines.[30] Archaic material evidence from Agrigento is also limited to two heads of kouroi, while the next archaeological material starts with the end of the first quarter of the fifth century.[31]

It was noted that physicians, philosophers, and artists (mainly sculptors) travelled widely, and this probably explains why, even from a brief survey, it appears that, at about the same time, similar experiments with a more accurate rendering of human anatomy were carried out in most areas of the Greek world, in different media.[32] Although comparison with

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the city", *Culture et Cité* (Brussels 1995)12.

[29] Paus. 6.14.2: statue of the athlete Milos by Dameas, a native of Kroton. About the offerings of Kroton in the sanctuary of Delphi fto commemorate the victories of its citizens, see Rougemont, G., "Delphes et les cités grecques d'Italie du sud et de la Sicile", *La Magna Grecia e i grandi santuari della Madrepatria* (Taranto 1992) 162.

[30] See Sabbione, Cl., "l'artigiano artistico", *Crotone, Atti del vetitrecesimo convengno di studi sulla Magna Grecia.* Taranto 7-10 ottobre 1983 (Taranto 1984) 245-301.

[31] See Holloway, R.R., *Influences and Styles in the late Archaic and early Classical Greek Sculpture of Sicily and Magna Graecia* (Louvain 1975) 27-30, and for the early fifth century findings, see for example, the injured warrior, Barbanera, M., *Il guerriero di Agrigento. Una probabile scultura frontonale del Museo di Archeologia "siceliota"* (Rome 1995) 57-75.

[32] In marble (*e.g.* rendering of emotion and motion on the Siphnian Treasury, dying giant from the north frieze, Delphi, Archaeological Museum 1179, see Brinkmann, *Siphnierschatzhauses*, fig. 27) but also in large-scale terracottas (see *e.g.* for experiments with motion, warrior: Olympia, Archeological Museum T214, Moustaka, *OlF* 22 (1993) pls. 16-18; rendering of emotion on terracotta heads from Korinth, Perachora, *Hesperia* 26 (1957) 307-308), gems (Boardman, J., *Archaic Greek Gems. Schools and Artists in the Sixth and Fifth centuries B.C.* (London 1968), from the Group of the Dry Style, 73-83; and mainly the works of Epimenes, dated around the turn of the century, and who is considered to be from the

archaeological evidence from other parts of the Greek world raises difficulties due to the scarcity and diversity of the material, and to the lack of secure chronology which does not allow us to point out mutual influences since most material is dated by stylistic comparisons,[33] it seems that artists in places, such as the Panhellenic sanctuaries (Delphi, Olympia, Delos) and cities, such as Aegina and Paros,[34] which have a long-established artistic tradition and where artists and artisans from different parts of the Greek world met, develop naturalism in the rendering of the human figure at about the same time as Athens: the challenge and the exchanges between philosophers, physicians and artists which probably took place in these areas might have been the main conditions which favoured the move away from the conventional conception and rendering of the human figure.

Ionian area, 93-94), and coins (see Oeconomides, M., "The human figure in Archaic Greek coinage", *New Perspectives*, 273-283..

[33]For Ionian sculpture, only few fixed dates are known: the reliefs from the Artemison at Ephesos which are associated with Kroisos (Hdt 1.92), and the destruction of the city of Miletos and Didyma by the Persians (Hdt 6.19), see Tüchelt, *Skulpturen* 131. For the difficulties encountered in dating Samian sculpture, the chronology of which is mainly provided by parallels with mainland Greece, see *Samos* XI, 2. The chronology of Cycladic sculpture in the round and in relief is also provided by stylistic comparisons, see Hiller, *Ionische Grabreliefs*, 68-73.

[34] From the early fifth century, Ionian places with long-established artistic tradition such as Miletos and Didyma were destroyed because of the Ionian revolt; Samos and Ephesos were under Persian occupation and do not provide us with a significant number of sculptures see, Hiller, *Ionische Grabreliefs*, 22.

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1, 1. Athens, Acropolis Museum 120 (**S1**) (author)
1, 2. Athens, Acropolis Museum 140 (**S3**) (*AMA*, pl. 9)
2, 1. Athens, Acropolis Museum 145 (**S6**) (author)
2, 2. Athens, Acropolis Museum 370 (**S6**) (*AMA*, figs. 326-327)
3, 1. Athens, Acropolis Museum 145 (**S6**) (author)
3, 2. Athens, Acropolis Museum 302 (**S8**) (*AMA*, pl. 124)
4, 1. Athens, Acropolis Museum 499 (**S9**) (*AMA*, figs. 189-190)
4, 2-5, 1. Athens, Acropolis Museum 581 (**S11**) (author)
5, 2. Athens, Acropolis Museum, 584 (**S12**) (*AMA*, pl. 109)
6-7. Athens, Acropolis Museum 594 (**S13**) (author)
8-9. Athens, Acropolis Museum 599 (**S14**) (*AMA*, pl. 130; author)
10. Athens, Acropolis Museum 625 (**S16**) (author)
11, 1-2. Athens, Acropolis Museum 629 (**S17**) (Schrader, *AMA*, pl.132; Trianti, *The Archaeology of Athens*, 90, fig. 1)
12. Athens, Acropolis Museum 631A (**S18**) (author)
13, 1. Athens, Acropolis Museum 631A (**S18**) (author)
13, 2. Athens, Acropolis Museum 631B (**S18**) (author)
14, 1. Athens, Acropolis Museum 631A (**S18**) (*AMA*, pl. 186)
14, 2-15, 1. Athens, Acropolis Museum 631C (**S18**) (*AMA*, pl. 188)
15, 2. Athens, Acropolis Museum 631A (**S18**) (*AMA*, pl. 194)
16, 1. Athens, Acropolis Museum 643 (**S19**) (*AMA*, pl. 97)
16, 2. Athens, Acropolis Museum 657 (**S20**) (*AMA*, pl. 152)
17, 1. Athens, Acropolis Museum 669 (**S21**)(Sinn, *AM* 98 (1983) pl.7)
17, 2-18, 1. Athens, Acropolis Museum 671 (**S22**) (*AMA*, pls. 25-26)
18, 2-19. Athens, Acropolis Museum 672 (**S22**) (*AMA*, pls. 59; 103)
20. Athens, Acropolis Museum 673 (**S24**) (*AMA*, pl. 74)
21-22. Athens, Acropolis Museum 674 (**S25**) (author)
23-25. Athens, Acropolis Museum 681 (**S26**) (author, *AMA*, pl. 51)
26. Athens, Acropolis Museum 684 (**S27**) (*AMA*, pl. 79)
27-28. Athens, Acropolis Museum 686 (**S28**) (*AMA*, pls. 45-46)
29-30, 1. Athens, Acropolis Museum 689 (**S29**) (author)
30, 2. Athens, Acropolis Museum 689 (hips) (**S29**) (*AMA*, pl. 127)
31. Athens, Acropolis Museum 690 (**S30**) (*AMA*, pl. 91)
32-34. Athens, Acropolis Museum 692 (**S31**) (author)
35-38. Athens, Acropolis Museum 698 (**S32**) (author)
39, 1. *Ibid*, (*AMA*, pl. 123)
39, 2 - 40, 1. Athens, Acropolis Museum 1332 (**S34**) (author)
40, 2. Athens, Acropolis Museum 3719 (**S35**) (*AMA*, pl. 127)
41. Athens, Acropolis Museum 4075 (**S36**) (*AMA*, pl. 117)
42-43. Athens, Kerameikos Museum P 744 (**S37**) (author)
44, 1-2. Athens, Kerameikos Museum P 1002 (**S38**) (drawing, author)
45. Athens, Kerameikos Museum P 1455 (**S39**) (Knigge, *AM* 98 (1983) pl. 12)
46-49. Athens, National Museum 29 (**S42**) (author)
50-52. Athens, National Museum 36 (**S46**) (author)
53-54. Athens, National Museum 1605 (**S48**) (author)
55-56. Athens, National Museum 1959 (**S49**) (author)
57-58. Athens, National Museum 3344 (**S51**) (author)
59-74, 1. Athens, National Museum 3476 (**S53**) (author)
74, 2. Drawing, of the upper limb (dissection)
75. Athens, National Museum 3477 (**S54**) (author)
76-77. Athens, National Museum 3687 (**S55**) (author)
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93, 1. Athens, National Museum 4472 (**S60**) (Richter, *AGA*, fig. 151)
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95. Delphi, Archaeological Museum 1794 + 4819 (**S66d**) (author)
96. Delphi, Archaeological Museum 1874+4821+4828 (**S66f**) (author)
97-98. Delphi, Archaeological Museum 4915 (**S66g**) (author)
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101. Delphi, Archaeological Museum 6476 (**S68d**) (author)
102. Delphi, Archaeological Museum 2029 (**S68g**) (author)
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108. Delphi, Archaeological Museum 391 (**S68k**) (author)
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118, 2. Paris, Musée du Louvre MA 2718 (**S72**) (Trianti, *The Archaeology of Athens*, 84)
119-120. Athens, National Museum 6181 (**B1**) (museum)
121-122. Athens, National Museum 6445 (**B2**) (Niemeyer, *AntPl* 3 (1964) pls. 17-19)
123. Athens, National Museum 6446 (**B3**) (museum)
124-125. Athens, National Museum 6448 (**B4**) (museum)
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129. Athens, National Museum 6474 (**B9**) (museum)
130. Athens, National Museum 6480 (**B12**) (Tölle-Kastenbein, *Peplosfiguren*, pl. 147b)
131, 1. Athens, National Museum 6412 (**B14**) (Tölle-Kastenbein, *Peplosfiguren,* pl. 149)
131, 2. Athens, National Museum 6514 (**B15**) (Tölle-Kastenein, *Peplosfiguren,* pl. 148)
132. Athens, National Museum 6566 (**B16**) (museum)
133. Athens, National Museum 6576 (**B17**) (museum)
134. Athens, National Museum 6585(**B18**) (museum)
135-136. Athens, National Museum 6586 (**B19**) (museum)
137. Athens, National Museum 6590 (**B20**) (museum)
138. Athens, National Museum 6592 (**B21**) (museum)
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141. Athens, National Museum 6598 (**B24**) (museum)
142. Athens, National Museum 6607 (**B27**) (museum)
143. Athens, National Museum 6610 (**B28**)(museum)
144. Athens, National Museum 6611 (**B29**) (museum)
145-146. Athens, National Museum 6614 (**B30**) (museum)
147-148. Athens, National Museum 6615 & 6930 (**B31**) (museum)
149. Athens, National Museum 6626 (**B32**) (museum)
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154. Piraeus, Archaeological Museum no inv. number (Dontas, *AKGP,* vol. 1, pls. 77)
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155, 2. Athens, Acropolis Museum10450 (**TC3**) (Alroth, *Boreas* 18 (1989), 89, fig. 47)
156, 1. Athens, Acropolis Museum 10484 (**TC4**) (*The Human Figure in early Greek Art*, no 59, 169
156, 2. Athens, Acropolis Museum 10695 (**TC5**) (Brouskari, *The Akropolis Museum*, fig. 37)
157. Athens, Acropolis Museum 10834 (**TC6**) (Nicholls, *The Eye of Greece*, fig. 27c)
158. Athens, Acropolis Museum 10895 (**TC7**) (Brouskari, *The Akropolis Museum*, fig. 34)
159. Athens, Acropolis Museum 12725 (**TC9**) (Croissant, *Protomés*, pl. 106)
160, 1. Athens, Acropolis Museum 12731 (**TC10**) (Brouskari, *The Akropolis Museum*, fig. 43)
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161. Athens, Acropolis Museum 12773 (**TC14**) (Croissant, *Protomés*, pl. 111)
162. Athens, Acropolis Museum 12788 (**TC15**) (Croissant, *Protomés*, pl. 110)
163, 1a. Athens, Acropolis Museum 13074 a & b (**TC16**) (Nicholls, *The Eye of Greece*, fig. 25b)

163, 1b. Athens, Acropolis Museum 17184 (**TC22**) (Nicholls, *The Eye of Greece*, fig. 25c)
163, 2. Athens, Acropolis Museum 12992 (**TC17**) (Brouskari, *The Akropolis Museum*, fig. 59)
164, 1. Athens, Acropolis Museum 13055 (**TC18**) (*Ibid.*, fig. 171)
164, 2. Athens, Acropolis Museum 13075 (**TC21**) (*Ibid.*, fig. 71)
165, 1. Athens, Acropolis Museum T 563 (**TC23**) (Thompson, *Hesperia* 8 (1939), 285, fig. 1)
165, 2. Athens, Acropolis Museum T4025 (**TC24**) (Shear, *Hesperia*, 42 (1973) pl. 75 a-b)
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168, 1. Berlin, Antikenmuseum 2190 (**TC29**) (Beazley, *JHS* 49 (1929), fig. 2)
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169. 1-2. Aleria, Musée Archéologique 61.35 (V1) (Sparkes, *Archaic*, pl. 25)
170. 1. Dissection of upper limb (drawing)
170. 2-3, Arezzo, Museo Nazionale Archeologico 1565 (**V2**) (*Euphronios. Atti* (1992) pls. 35-36)
171. *Ibid.*, (drawing)
172. Athens, Agora Museum P 24102 (**V3**) (author)
173. Athens, Agora Museum P 24131 (**V4**) (author)
174. Athens, Agora Museum P 26228 (**V5**) (author)
175. Athens, National Museum 515 (**V11**) (Haspels, *ABL*, pl. 43, 1a)
176, 1. Basel, Antikenmuseum und Sammlungen Ludwig BS 491 (**V15**) (*CVA* Basel 2, pl. 1)
176, 2. Berlin, Antikenmuseum 2278 (**V22**) (Simon, *Griechischen Vasen*, fig. 119)
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179. Berlin, Staatliche Museen 2160 (**V26**) (Beazley, *The Berlin Painter*, pl. 2)
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180, 3. Dissection of the male trunk (drawing)
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181. Berlin, Staatliche Museen 3232 (**V30**) (drawing)
182. Boston, Museum of Fine Arts 98.930 (**V35**) (Buitron-Oliver, *Douris*, pl. 49)
183, 1. Boston, Museum of Fine Arts 00. 338 (**V37**) (*Ibid.*, pl. 9)
183, 2. Boston Museum of Fine Arts 08.30a (**V41**)Vermeule, *AntK* 12 (1969) 10)
184, 1. Boston, Museum of Fine Arts 10.176 (**V42**) (drawing)
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186, 1. Brussels, Musées Royaux d'Art et d'Histoire A 717 (**V51**) (*CVA* Brussels 2, pl. 13)
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190, 2. Harrow, School Museum 55 (**V70**) (*Ibid.*, pl. 29)
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192, 2. Leiden, Rijksmuseum van Oudheden PC 83 (**V75**) (*CVA* Leiden 3, pl. 140, 2)
193, 1. Leipzig, Karl-Marx-Universität T516 (**V76**) (Williams, *New Perspectives*, 196, fig. 13)
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214-217. London, British Museum E12 (**V86**) (author)
218-221. London, British Museum E13 (**V78**) (author)
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230, 1. London, British Museum E 44 (**V91**) (*CVA* London, British Museum 9, pl. 9)
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236, 2. London, British Museum E 134.2 (**V99**) (Cohen, *J Paul Getty M* 4 (1989) 78, fig. 5)
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240-241, 1. London, British Museum E441 (**V103**) (author)
241, 2. Dissection of the upper limb
242, 1. London, British Museum E 441 (**V103**) (author)
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251, 1. London, British Museum 1922.10-18 (**V108**) (Haspels, *ABL*, pl. 22, 4 b)
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258. Mannheim, Reiss Museum Cg 183 (**V117**) (museum)
259, 1. Megara, Hyblaea, no inventory number (**V120**) (*Euphronios. Atti* (1992) pl. 30, 1)
259, 2. Munich, Antikensammlungen 1540 (**V126**) (*CVA* Munich 8, pl. 429, 1)
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263, 3. The male trunk (drawing)
264, 1. Dissection of the lower limb
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264, 3. Drawing of the lower limb.
265, 1. Munich, Antikensammlungen 2307 (**V130**) (Simon, *Griechischen Vasen*, fig. 113, 2)
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266, 1. Munich, Antikensammlungen 2421 (**V134**) (*CVA* Munich 5, pl. 225, 2)
266, 2. Ibid. (author)
267, 1. Munich, Antikensammlungen 2587 (**V135**) (Richter, Hall, *Red-figured Vasesin the Metropolitan Museum*, vol. 1, pl. 1)
267, 2-268. Munich, Antikensammlungen 2640 (**V137**) (Ohly-Duhm, *AV München*, vol. 1, pls. 21-22)
269, 1. Munich, Antikensammlungen 8935 (**V138**) (*Euphronios* (1990) no 5, 89)
269, 2. Ibid. (drawing)
270. Naples, Museo Archeologico Nazionale 2422 (**V141**) (Simon, *Griechischen Vasen*, figs. 128-129)
271. New York, Callimanopoulos Collection (**V142**) (*CVA* Castle Ashby 5, pl. 9-10)
272. New York, Callimanopoulos (**V143**) (Kurtz, *The Berlin Painter*, fig. 62a)
273. New York, Metropolitan Museum of Art 07.286.69 (**V145**) (Kurtz, *The Berlin Painter*, fig. 47c)
274, 1. New York, Metropolitan Museum of Art 14.130.12 (**V146**) (*CVA*, New York, MMA 3, pl. 39)

274, 2. New York, Metropolitan Museum of Art 56.17.17 (**V150**) (*CVA* New York, MMA 3, pl. 18)
275, 1. New York, Metropolitan Museum of Art 63.11.6 (**V151**) (drawing)
275, 2-276, 1. New York, Metropolitan Museum of Art 1972.11.10 (**V152**) (*Euphronios* (1990) 77-78)
276, 2. New York, L. Levy, Sh. White Collection (**V153**) (*Wealth of the Ancient World*, 58)
277, 1. New York, Market, Sotheby's (**V154**) (once Hunt Collection) (*Ibid.*, 54)
277, 2. Orvieto, Museuo Civico, Collection Faina 64 (**V157**) (Technau, *Corolla Ludwig Curtius*, 135)
278, 1. Palermo, Museo Nazionale G.E. 1896.1 (**V163**) (Haspels, *ABL*, pl. 14, 2)
278, 2. Paris, Cab.Méd. 538 (**V168**) (Buitron-Oliver, *Douris*, pl. 18)
279, 1. Paris Cab. Méd 604 & L155 (**V170**) (Sparkes, *Archaic*, pl. 22)
279, 2. Paris, Musée du Louvre B 905 (**V171**) (Charbonneaux, *Archaic Greece*, fig. 356)
280, 1. Paris, Musée du Louvre C 10474 (**V172**) (*CVA* Paris, Musée du Louvre 10, pl. 16, 4)
280, 2. Paris, Musée du Louvre F 129 (**V174**) (Denoyelle, *Collections du Louvre*, no 43, 96)
281, 1. Paris, Musée du Louvre F 204 (**V176**) (Simon, *Griechischen Vasen*, fig. fig. 100)
281, 2. Paris, Musée du Louvre G 2 (**V178**) (*Ibid.* pl. 6, 2)
282, 1. Paris, Musée du Louvre G 17 (**V182**) (*CVA Paris, Musée du* Louvre 10, pl. 6, 1A)
282, 2. Paris, Musée du Louvre G 42 (**V186**) (*Euphronios* (1990) no 62, 247)
283. Paris, Musée du Louvre G 103 (**V188**) (*Ibid.*, no 3, 67, 69)
284, 1. *Ibid.* (drawing)
284, 2. Drawing of the trunk
285. Paris, Musée du Louvre G 152 (**V191**) (Denoyelle, *Collections du Louvre*, no 56, 122)
286, 1. Paris, Musée du Louvre Cp 11071 (**V198**) (*Euphronios* (1990) no 22, 144)
286, 2. Pinceton, University Art Museum L. 1990. 134 a & b (**V200**) (*Ibid.*, no 50, 204)
287, 1. Rome Museo Gregoriano Etrusco Vaticano, Astarita 48 (**V202**) (Buitron-Oliver, *Douris*, pl. 68)
287, 2. Rome, Museo Gregoriano Etrusco Vaticano 16451 (**V206**) (drawing)
288, 1. St Petersburg, Hermitage Museum 609 (**V211**) (Kurtz, *The Kleophrades Painter*, pl. 21)
288, 2-289, 1. St Petersburg, Hermitage Museum B 644 (**V212**) (*Euphronios* (1990) no 33, 164-165)
289, 2. St Petersburg, Hermitage Museum B2351 (**V215**) (*Ibid.*, no 17, 132)
290, 1. Drawing of the knee
290, 2. St Petersburg, Hermitage Museum B2351 (**V215**) (drawing)
290, 3. Dissection of the lower limb
291. Tarquinia, Museo Nazionale Tarquiniense RC 6843 (**V221**) (Charbonneaux, *Archaic Greece*, figs. 330-331)
292, 1. Tarquinia, Museo Nazionale Tarquiniense RC 6847 (**V222**) (drawing)
292, 2. Tübingen, Antikensammlung des Arcäologischen Instituts S/10 1559 (**V227**) (*CVA* Tübingen 5, pl. 6, 4)
293, 1. Vienna, University 631 a (**V230**) (Kenner, *Jh. Öst. Inst.* 28 (1933) 42, fig. 20)
293, 2. Vienna, Kunsthistorisches Museum 1848 (**V231**) (*CVA* Vienna, 1, pl. 5, 1)
294-295, 1. Vienna, Kunsthistorisches Museum 3710 (**V233**) (*CVA* Vienna 1, pls. 35-37)
295, 2. Warsaw, National Museum 142.332 (**V235**) (Beazley, *Greek Vases in Polland*, pl. 5)
296, 1. Drawing of the lower limb
296, 2. Dissection of the lower limb
296, 3. Warsaw, National Museum 142.332 (**V235**) (drawing)
297, 1. Warsaw, National Museum 142.463 (**V236**) (Beazley, *Greek Vases in Polland*, pl. 3, 1)
297, 2. Würzburg, Martin von Wagner Museum 545 (**V241**) (Williams, *New Perspectives*, 291, fig. 6)
298. Athens, National Museum 11761 (out of catalogue)
299, 1. Taranto, Museo Archeologico Nazionale 121.327 (*Ibid.*)
299, 2. Boulogne, Musée Communal 558 (*Ibid.*)
300. Viscerae and superficial blood-vessels of the human body (*Ibid.*) (after a drawing of Leonardo daVinci)

ABBREVIATIONS

In addition to the bibliographical abbreviations set out in the *Archäologische Bibliographie* (1992), the following are used in the footnotes and in the catalogue.

ABV	Beazley, J. D., *Attic Black-figure Vase-painters* (Oxford 1956)
Adam, *Technique*	Adam, S., *The Technique of Greek Sculpture in the Archaic and Classical Period* (London 1966)
Add^2	*Beazley Addenda, Additional References to ABV, ARV*^{2} *& Paralipomena,*^{2} compiled by Carpenter, T. H. (Oxford 1989)
AKGP	*Archaische und Klassische griechische Plastik. Akten des internationalen Kolloquiums von 22.-25. April 1985 in Athen*, ed. Kyrieleis, H., vol. 1 (Mainz am Rhein 1986)
AMA	Langlotz, E., Schrader, H., Schuchhardt, W-H., *Die archaischen Marmorbildwerke der Akropolis* (Frankfurt am Mainz 1939)
Ancient Greek Art and Iconography	*Ancient Greek Art and Iconography*, ed. Moon, W. G. (Madison Wisc. 1983)
The Archaeology of Athens	*The Archaeology of Athens and Attica under the Democracy*, eds. Coulson W. D., Shapiro, H. A., Frost, F. J. (Oxford 1994)
Archaic	*Greek Art, Archaic into Classical. A Symposium held at the University of Cincinnati. April 2-3 1982, ed. Boulter, C.G.* (Leiden 1985)
Arias, Hirmer, *Painting*	Arias, P. E., Hirmer, M., Shefton, B. B., *A History of Greek Vase-painting* (London 1962)
ARV^2	Beazley, J. D., *Attic Red-figure Vase-painters*^{2} (Oxford 1963)
Beazley, *Dev*	Beazley, J. D., *The Development of Attic Black-figure* (Berkeley & Los Angeles 1951)
Beazley, *VAM*	Beazley, J. D., *Attic Red-figured Vases in American Museums* (Rome 1918)
Beazley, *The Kleophrades Painter*	Beazley, J. D., *The Kleophrades Painter* (Mainz 1974)
Blümel, *Katalog*	Blümel, C., *Staatliche Museen Berlin. Katalog der Sammlung antiker Skulturen*, vol. 2, 1, *Griechische Skulpturen des sechsten und fünften Jahrhunderts v. Ch.* (Leipzig 1940)
Boardman, *ARFVAP*	Boardman, J., *Athenian Red figure Vases. The Archaic Period*^{2} (London 1988)

Boardman, *ABFV*	Boardman, J., *Athenian Black figure Vases*^{2} (London 1988)
Boardman, *GSAP*	Boardman, J., *Greek Sculpture. The Archaic Period*^{2} (London 1991)
Brouskari, *The Akropolis Museum*	Brouskari, M., *The Akropolis Museum. A descriptive Catalogue* (Athens 1974)
Bruhn, *Oltos*	Bruhn, A., *Oltos and early red-figure Vase-painting* (Copenhagen 1943)
Buitron, *New England Collections*	Buitron, D.M., *Attic Vase-painting in New England Collections* (Cambridge Mass. 1972)
Buitron-Oliver, *Douris*	Buitron-Oliver, D. M., *Douris, a Master Painter of Athenian Red-figure Vases* (Mainz am Rhein 1995)
Burrow, *Antimenesmaler*	Burrow, J., *Der Antimenesmaler* (Mainz 1989)
CAH	*Cambridge Ancient History*
Casson, *Technique*	Casson, S., *The Technique of early Greek Sculpture* (Oxford 1933)
CB	Beazley, J. D., Caskey, L. D., *Attic Vase-painting in the Museum of Fine Arts, Boston* (Oxford 1954)
Charbonneaux, *Archaic Greece*	Charbonneaux, J., Martin, R., Villard, F., *Archaic Greek Art. 620-480 B.C.* (London 1971)
Cohen, *Bilingual Vases*	Cohen, B., *Attic Bilingual Vases and their Painters* (New York & London 1978)
Croissant, *Protomés*	Croissant, F., *Les protomés féminines archaïques. Recherches sur les représentations du visage dans la plastique grecque de 550 à 480 avt. J-Ch.* (Paris 1983)
Culture et Cité	*Culture et Cité. L'avénement d'Athènes à l'époque archaïque. Actes Colloque International.* (ULB 25-29 avril 1991) eds. Verbanck, A., Viviers, D. (Brussels 1995)
CVA	*Corpus Vasorum Antiquorum*
Daremberg, *La médecine*	Daremberg, L., *La médecine chez Homère* (Paris 1865)
Dickins, *Catalogue*	Dickins, G., *Catalogue of the Acropolis Museum*, vol. 1 (Cambridge 1912)
Dover, *Greek Homosexuality*	Dover, J. K., *Greek Homosexuality* (London 1978)
Duminil, *Le sang, les vaisseaux*	Duminil, M-P., *Le sang, les vaisseaux, le coeur dans la Collection Hippocratique: anatomie et physiologie* (Paris 1983)
EAA	*Enciclopedia dell'Arte Antica Classica e Orientale*

Eaverley, *Equestrian Sculpture*	Eaverley, M. A., *Archaic Greek Equestrian Sculpture* (Michingan 1995)
Edelstein, *Ancient Medicine*[2]	Edelstein, L., *Ancient Medicine. Selected Papers of Ludwig Edelstein,*[2] eds. Temkin, O., Temkin, C. L. (Baltimore 1987)
Empedokles (Wright)	*Empedokles. The extant Fragments,*[2] ed. transl. Wright, M. R. (London 1995)
Euphronios (1990)	*Euphronios. Peintre à Athènes au Vie siècle avant J-Chr.* (Exhibition Catalogue Paris 1990)
Euphronios. Atti (1992)	*Euphronios. Atti del seminario internazionale di studi.* Arezzo 27-28 Maggio 1990, eds. Iozzo, M., Nicosia, F., Zamarchi Grassi, P. (Florence 1992)
Euphronios peintre (1992)	*Euphronios peintre. Actes de la journée d'études (10 octobre 1990),* ed. Denoyelle, M. (Paris 1992)
The Eye of Greece	*The Eye of Greece. Studies in the Art of Athens,* eds. Kurtz, D. C., Sparkes, B. (Cambridge 1982)
F.D.	*Fouilles de Delphes*
Frel, *Greek Portraits*	Frel, J., *Greek Portraits in the J. Paul Getty Museum* (Malibu 1982)
Frontisi-Ducroux, *Du masque au visage*	Frontisi-Ducroux, F., *Du masque au visage: aspects de l'identité en Grèce ancienne* (Paris 1995)
Graef, Langlotz, *Vasen von der Akropolis*	Graef, B., Langlotz, E., *Die antiken Vasen von der Akropolis zu Athen* (Berlin 1925-1933)
GV J Paul Getty M	*Greek Vases in the J. Paul Getty Museum*
Hamiaux, *Les sculptures grecques*	Hamiaux, M., *Les sculptures grecques du Louvre* (Paris 1992)
Harris, *The Heart and Vascular System*	Harris, C. R. S., *The Heart and Vascular System in ancient Greek Medicine. From Alkmaeon to Galen* (Oxford 1973)
Haspels, *ABL*	Haspels, C. H. E., *Attic Black-figured Lekythoi* (Paris 1936)
Haynes, *Technique*	Haynes, D. E. L., *The Technique of Greek Bronze Statuary* (Mainz am Rhein 1992)
Hermary, *Délos*	Hermary, A., *Exploration archéologique de Délos faite par l'EFA. La sculpture archaïque et classique*, vol. 1 (Paris 1984)
Higgins, *Terracottas*	Higgins, R. A., *Greek Terracottas* (London 1967)
Hiller, *Ionische Grabreliefs*	Hiller, H., *Ionische Grabreliefs der ersten Häfte des 5. Jahrhunderts v. Chr.* (Tübingen 1975)
Hippocratica	*Hippocratica. Actes du Colloque Hippocratique de Paris,*

	4-9 septembre 1978, ed. Grmek, M. D. (Paris 1980)
Hoppin, *A Handbook*	Hoppin, J. C., *A Handbook of Attic Red-figured Vases by or attributed to the various Masters of the Sixth and Fifth centuries B.C.* (Cambridge Mass. 1919)
Houser, *Monumental Bronze*	Houser, C., *Greek Monumental Bronze Sculpture* (London 1983)
Hurwitt, *The Art and Culture*	Hurwitt, J. M., *The Art and Culture of early Greece: 1100-480 B.C.* (London 1985)
I Greci in Occidente	*I Greci in Occidente. Exhibition Catalogue*, ed. Cartarelli, G. (Venice 1996)
Isler-Kerenyi, *Nike*	Isler-Kerenyi, C., *Nike. der Typus der laufenden Flügelfrau in archaïscher Zeit* (Zurich & Stuttgart 1969)
Johansen, *The Iliad in early Greek Art*	Johansen, K. F., *The Iliad in early Greek Art* (Copenhagen 1967)
J Paul Getty M J	*The J. Paul Getty Museum Journal*
Karouzos, *Aristodikos*	Karouzos, Chr., *Aristodikos. Zur Geschichte der spätarchaischer attischen Plastik und der Grabstatue* (Stuttgart 1961)
Korshak, *FF*	Korshak, Y., *Frontal Faces in Attic Vase-painting of the Archaic Period (*Chicago 1987)
Kurtz, *The Berlin Painter*	Kurtz, D. C., *The Berlin Painter* (Oxford 1983)
Langlotz, *Griechische Vasen*	Langlotz, E., *Griechischen Vasen. Martin von Wagner. Museum der Universität Würzburg* (Munich 1932)
LIMC	*Lexikon Iconographicum Mythologiae Classicae*
Loggrig, *Greek Rational Medicine*	Logrigg, J., *Greek Rational Medicine* (London & New York 1993)
Martini, *Die archaische Plastik*	Martini, W., *Die archaische Plastik der Griechen* (Darmstadt 1990)
Mattusch, *GBS*	Mattusch, C. C., *Greek Bronze Statuary from the Beginning through the Fifth Century B.C.* (New York 1988)
Mattusch, *CB*	Mattusch, C. C., *Classical Bronzes: the Art and Craft of Greek and Roman Statuary* (New York 1996)
Methods and Problems	Lloyd, G. E. R, *Methods and Problems in Greek Science. Selected Papers* (Cambridge 1991)
Metraux, *Sculptors and Physicians*	Metraux, G., *Sculptors and Physicians in fifth-century Greece. A preliminary Study* (Montreal 1995)
Mitropoulou, *Corpus I*	Mitropoulou, E., *Corpus I, Attic Votive Reliefs of the Sixth and Fifth Centuries B.C.* (Athens 1977)

Moon, Berge, *Midwestern Collections*	Moon, W. G. , Berge, L., *Greek Vase-painting in Midwestern Collections* (Chicago 1979)
New Perspectives	*New Perspectives in early Greek Art*, ed. Buitron-Oliver, D. M. (Hannover & London 1991)
Noble, *Technique*^{2}	Noble, J. V., *The Technique of painted Attic Pottery*^{2} (London 1988)
OlF	*Olympische Forschungen*
Ohly-Dumm, *AV München*	Ohly-Dumm, M., *Attische Vasenbilder der Antikensammlungen in München nach Zeichnungen von Karl Reichhold* (Munich 1975)
Die Olympia Skulpturen	*Die Olympia Skulpturen*, ed. Hermann, H. V. (Darmstadt 1987)
Para	*Paralipomena. Additions to Attic Black-figure Vase-painters and to Attic Red-figure Vase-painters* (Oxford 1971)
Payne, *AMS*	Payne, H.,G., Young, G. M., *The Archaic Marble Sculpture from the Acropolis* (London 1936)
Polichromia nella statuaria	Manzelli, V., *La polichromia nella statuaria greca arcaica* (Rome 1994)
Pollitt, *Ancient View*	Pollitt, J. J., *The ancient View of Greek Art. Criticism, History and Terminology* (New Haven & London 1974)
Polykleitos	*Polykleitos. The Doryphoros and Tradition*, eds. Fowler, B. H., Moon, W. G. (Madison Wisc 1995)
Raubitscheck, *DAA*	Raubitscheck, A. E., *Dedications from the Athenian Akropolis. A Catalogue of the Inscriptions of the Sixth-Fifth c. B.C.* (Cambridge Mass. 1949)
RE	*Real-Encyclopädie der Classischen Altertumswisschaft*
Recueil Milliet	Reinach, A., *Textes grecs et latins relatifs à la peinture ancienne. Recueil Milliet,*^{2} introduction et notes par Rouveret, A. (Paris 1985)
Richter, *AGA*	Richter, G. M. A., *The Archaic Gravestones of Attica* (London & New York 1961)
Richter, *Korai*	Richter, G. M. A., *Korai. Archaic Greek Maidens. A Study of the Development of the Kore Type in Greek Sculpture* (London 1968)
Richter, *Kouroi*^{3}	Richter, G. M. A., *Kouroi. Archaic Greek Youths. A Study of the Development of the Kouros Type in Greek Sculpture*^{3} (London 1970)
de Ridder, *Bronzes*	de Ridder, A., *Catalogue des bronzes trouvés sur l'Acropole* (Paris 1896)

Ridgway, *Archaic Sculpture*	Ridgway, B. S., *The Archaic Style in Greek Sculpture* (Princeton 1977)
Robertson, *HGA*	Robertson, C. M., *A History of Greek Art* (Cambridge 1975)
Roberston, *AVPCA*	Robertson, C. M., *The Art of Vase-painting in Classical Athens* (Cambridge 1992)
Rolley, *Bronzes*	Rolley, Cl., *Greek Bronzes* (London 1986)
Rolley, *Sculpture*	Rolley, Cl., *La sculpture grecque, vol. 1. Des origines au milieu du Ve siècle* (Paris 1994)
Rouveret, *Peinture et imaginaire*	Rouveret, A., *Histoire et imaginaire de la peinture ancienne* (Ve s. avt. J-Chr.-Ie s. apr. J-Chr.) (Rome 1989)
Samos XI	Freyer-Schauenburg, B., *Bildwerke der archaischen Zeit und des strengen Stils, Samos XI* (Bonn 1974)
Scheffold, *Götter*	Scheffold, K., *Götter und Heldensagen der spätarchaischen Kunst* (Munich 1978)
Schmalz, *Grabreliefs*	Schmalz, B., *Griechische Grabreliefs* (Heidelberg 1983)
Science, Folklore and Ideology	Lloyd, G. E. R., *Science, Folklore and Ideology. Studies in the Life Sciences in ancient Greece* (Cambridge 1983)
Simon, *Griechischen Vasen*	Simon, E., Hirmer, M., *Die Griechischen Vasen* (Munich 1976)
Snowden, *Blacks in Antiquity*	Snowden, F. M., *Blacks in Antiquity. Ethiopians in the Greco-Roman Experience* (Cambridge Mass. 1970)
Stewart, *Sculpture*	Stewart, A., *Greek Sculpture. An Exploration* (New Haven & London 1990)
Stuart-Jones, *Selected Passages*	Stuart-Jones, H., *Selected Passages from ancient Writers illustrative of the History of Greek Sculpture*^{2} (Chicago 1966)
Studien zur Polychromie	Reuterswärd, P., *Studien zur Polychromie der Plastik Griecheland und Rom. Untersuchungen über die Farbirwung der Marmor und Bronzeskulpturen* (Stockholm 1960)
Thomas, *Athletenstatuetten*	Thomas, R., *Athletenstatuetten des spätarchaik und des strengen Stils* (Rome 1981)
Tölle-Kastenbein, *Peplosfiguren*	Tölle-Kastenbein, R., *Frühklassische Peplosfiguren Originale* (Mainz 1980)
Viviers, *Sculpteurs*	Viviers, D., *Recherches sur les ateliers de sculpteurs et la cité d'Athènes à l'époque archaïque: Endoios, Philergos, Aristokles* (Brussels 1992)
Walter-Karydi, *Alt-Ägina*	Walter-Karydi, E., *Die äginetische Bildhauerschule. Werke und schriftliche Quellen. Alt-Ägina*, vol. 2 (Mainz am

	Rhein 1987)
Wealth of the ancient World	*Wealth of the ancient World, the Nelson Bunker Hunt and William Herbert Hunt Collection*, ed. von Bothmer, D. (Forth Worth 1983)
Xenophanes	Lesher, T., *Xenophanes of Kolophon, Fragments: a Text and Translation with a Commentary* (Toronto 1992)
ZVP	Langlotz, E., *Zur Zeitbestimmung der strengrotfigurigen Vasenmalerei und der gleichzeitigen Plastik* (Leipzig 1920)

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