Science, the arts, and society in the eighteenth-century Dutch Republic

Petrus Camper in context

Klaas van Berkel and Bart Ramakers (eds.)

Bones, law and order in Amsterdam

Petrus Camper's morphological insights

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Natural history

In early modern Europe, the principal criterion of ethnic difference had been religion; then skin colour; and then, by the mid-1780s, skull shapes. The accidental linchpin in the move from pigmentation to craniometry appears to be Petrus Camper. Expressing racial distinctions as a function of angles and ratios, Camper found a convenient quantitative means for comparative analysis. Since the slant of the 'facial line' affected the scale of the head's components, the measurement of the so-called 'facial angle' in profile served as an index. Posthumously, Camper became known as a racist when his pictures were applied to agendas other than his original intentions. In his endeavours to find the integral operations behind bewildering diversity, he unknowingly blazed a trail for a future forensic anthropology.

While Camper narrated how he stumbled upon the formative facial angle law, he saw what he had been mentally prepared to see by Georges-Louis Leclerc, Comte de Buffon (1707-1788). The director of the French king's collections critiqued the reigning Cartesian mechanical philosophy as unsuitable for life sciences. He explained the interconnected whole of animate nature in as few terms as possible: that living matter was characterised by animation, conjunction, and the ability to reproduce.[1] Camper represented these vital processes by 'de lastige, en allezints onzinnelijke Ontleedkunde der Dieren met de schoone, en bevallige Schilderkonst te zaamen te paaren' ('combining the exacting and in every respect disgusting Dissections of Animals with the beautiful and graceful Art of Painting together').[2] Unlike most anatomists, Camper did not have to collaborate with a draftsman. While artistic training facilitated his recognising the facial angle to be a regulative principle, Camper's evidence rested on real and identifiable human skulls.

1 Reill, *Vitalizing nature*, 43-47.
2 Camper, *Redenvoeringen*, 25-26.

Cosmopolitan Amsterdam

As a physician Camper accorded primacy to the evidence of the senses over the classical authorities. A greater supply of post-mortem research material lured him into leaving Franeker for Amsterdam. In 1755 he accepted an invitation to teach anatomy and surgery at the Athenaeum Illustre, Amsterdam's public college. Camper became the first to hold that position at the same time as a College of Surgeons' anatomy prelectorship.[3] Three years later the Athenaeum also made him a professor of medicine. Binnengasthuis cadavers had been shipped to Camper in Franeker, where he dissected them in public only once (December 14, 1750).[4] In Amsterdam the city council of the previous century had decided to give the unclaimed bodies of foreigners or patients to anatomists. Removing the obligation to wait for criminal executions increased the supply of corpses, for Amsterdam was the republic's most populous city. By 1765 Camper had performed more than 50 public autopsies – half on men, half on women.[5]

In the mid-eighteenth century the commonwealth's capital was still a thriving port with daily trade. This allowed Camper to buy monkeys, the dissections of which he needed in order to understand 'the most precious and valuable works of the immortal Galen'.[6] Claudius Galen, the second-century Greek physician in Roman service, was considered the greatest authority on human anatomy. In 1543, when Galen's descriptions were compared to direct observations, Andreas Vesalius (1514-1564) had come to the revolutionary conclusion that Galenic human anatomy was based on animal dissections only. Camper had the means to reconcile old knowledge with the new. His personal wealth increased through inheritance and marriage, and he accumulated a *cabinet* (museum), one of the century's largest and most important private collections, at his summer home in the Frisian countryside. Around 1756 he procured his first African foetus in alcohol.

Two years later Camper dissected an Angolan boy in the anatomical theatre. To disprove the prejudice 'dat de Negers en Zwarten, weleer uit de vermenging van blanke menschen met groote Aapen of Orang-Outangs (…) afkomstig waren' ('that the Negroes and the Blacks had originated from the intercourse of white people with big Apes or orang-utans'), he compared the 11-year-old with a 1699 printed ape autopsy.[7] The first man to dissect an anthropoid ape,

3 Daniëls, *Leven*, 140; Van Eeghen, 'Van gasthuis', 91.
4 Daniëls, *Leven*, 64, 131.
5 P. Camper, 'Inleiding (…) over de ontleding (…) Groningen 1763-1768' (November 13, 1765), 70. Special collections, University of Amsterdam, MS II F 71; Daniëls, *Leven*, 14-16.
6 Camper, 'Organs of speech', 140-141.
7 Camper, 'Kleur der zwarten', 381.

Edward Tyson, MD (1650-1708) also initiated the idea that it was an intermediate between humanity and animals in the *scala naturae*.[8] Tyson's draftsman depicted the ape's dissections in the same poses as the 'muscle men' in Vesalius's *De humani corporis fabrica* (On the fabric of the human body) (Basel, 1543). Camper 'moest bekennen, niets te vinden, 't welke met dit dier meerder overeenkomst hadde, dan met een wit mensch; integendeel, alles was gelyk' ('found nothing that had more in common with this animal than with a white person; on the contrary, everything was the same').[9] He was attempting to calm the anxieties of a shrinking world.[10]

In Amsterdam, Camper learned first-hand that black babies were 'blank, of liever roodagtig gebooren worden, gelyk de onzen, en dat zy eenige dagen daar na bruin, en vervolgens zwart worden' ('born white or rather reddish, like ours, and that they become brown a few days later and then black').[11] The burgomasters had also designated him a city accoucheur (male midwife). Every three months, the hospital, St. Pieters Gasthuis, delivered female cadavers for Camper to use in teaching midwives.[12] European women could not always give birth or survive pregnancy without the assistance of instruments. High heels, malnutrition, or common rickets could deform a female pelvis; wedged baby heads appeared to be on the increase.[13] To examine the reasons for their women's supposedly easier deliveries, with great trouble Camper acquired African, Asian, and American pelvic bones and found they had more capacious dimensions. He set the optimum measure of a pelvic angle to 100° for European women and to 125° for African women.[14]

In researching hernia trusses, Camper discovered *une différence très-remarquable* between black men and others in the breadth of the hips compared with their depth.[15] When this was not due to their heads' heaviest part being behind the centre of motion, it came from early crippling distorting their alignment.[16] Movement's equilibrium was affected by lameness or pregnancy, gender and age.[17] Tracing anomalies to childhood made Camper a pioneer paediatrician. He collected the remains of people who'd had limps for teach-

8 Tyson, *Orang-outang*, iii.
9 Camper, 'Kleur der zwarten', 381.
10 Camper, *Verhandeling van Petrus Camper*, 33.
11 Camper, 'Kleur der zwarten', 389.
12 P. Camper, 'Lessen over de Verloskunde gehouden voor de vroedvrouwen te Amsterdam en begonnen 6 Oct. 1757'. Special collections, University of Leiden, MS BPL 247.61; Daniëls, *Leven*, 141.
13 Camper, 'Brief (…) aan den heere David van Gesscher', 386-411.
14 Camper, 'Zusätze zu den Betrachtungen', 342-343. Schiebinger, *Nature's body*, 156-157, 255 n41.
15 Camper, 'Mémoire sur la construction des bandages pour les hernies', 632-633.
16 Camper, *Verhandeling van Petrus Camper*, 54-55.
17 Camper, 'Den besten schoen', 275-309.

ing and published on children's physical upbringings with his own illustrations of smallpox variolation.[18] He devised experiments to detect objectively if a dead newborn was a natural stillborn or a victim of infanticide.[19]

Authorised as an Adjunct Surgeon of Justice, Camper examined about 200 corpses every year for the cause of death.[20] Countless children died from sickness, neglect, or hunger at various ages. He collected their skulls, representing life's full spectrum before and after birth, to determine the skeletal changes that accompany normal aging to outright pathology. His osteological preparations were less a sequence of structures than a display of nature's formative forces.[21] To ascertain the inherent operations that moulded external shapes, he decided to examine the 'hollows of the side which (…) the French, whose word we adopt, call the *profile*' for better understanding, analogous to looking at a ship model cut in half at its longest axis:[22]

> I sawed several heads perpendicularly in half, both of Human Beings as of Quadrupeds, and imagined I saw clearly, that the cranial cavity for the brain was indeed generally regular, but that the placing of the upper and lower jaw constituted the natural difference for the amazing variety.[23]

> ik zaagde derhalven verscheidene hoofden, in het midden, loodlijnig door, zoo van Menschen als van viervoetige Dieren, en verbeeldde mij klaar te zien, dat de holte tot de herssenen geschikt, wel over het algemeen geregeld was, dog dat de plaatzinge van de opper- en onderkaak het natuurlijk onderscheid maakte van die verbazende verscheidenheid.

At this moment Camper must have recalled the 'Discourse on the manner to study and treat natural history' (*Histoire naturelle*) in which Buffon defined living nature as a merging of determinism and creativity.[24] The skulls' cross-sections revealed a simultaneous preservation of a regular order and specific variations.

18 Camper, 'Brief (…) aan (…) Bs. Hussem', 96-102; Camper, 'Het bestier van kinderen', 357-464; Camper, *Aanmerkingen over de inëntinge*.
19 Camper, *Gerechtelyke en ontleedkundige verhandeling*.
20 Daniëls, *Leven*, 141; Van Eeghen, 'Van gasthuis', 91.
21 Camper, *Description succincte du musée*, 2.
22 'Holligheden van ter zyde (…), de Franschen welkers woord wy overgenoomen hebben noemen dit het profil'. Camper, 'Inleiding (…) over de ontleding (…) Groningen, 1763-1768' (February 27, 1765), 56-57. Special collections, University of Amsterdam, MS II F 71.
23 Camper, *Verhandeling van Petrus Camper*, vi-vii.
24 Buffon, 'De la manière d'étudier', 1-64.

Organic forms

According to Buffon, the life sciences were not about certitude but about probability derived from the same occurrences and immense variety. Although the combination of the general and the particular, the *Histoire naturelle*'s subtitle, seemed contradictory, their interplay would attain a higher degree of understanding by discovering what united the antinomies. Mediation between regular development and free creation elucidated similar tendencies among dissimilar organisms, perceived through analogies. Regulative patterns, controlled by formative principles that hid within organised matter, served as the general laws for organic life.[25] This hidden organiser Buffon named the *moule intérieur*.[26] The 'internal mould' could never be directly identified but was attested to by its external modifications.

No single element could be removed from an organic whole without changing the *rapports* (relations) between the remaining parts. This idea had been articulated by Aristotle: 'for nature invariably gives to one part what she subtracts from another'.[27] In making interconnection central to the life sciences, Buffon changed the concept of cause and effect. Since each constituent part of an organised body was both cause and effect of the other parts, immense variation could result from even slight alterations. All the widely divergent vertebrate forms were modifications of a similar form.[28]

It was Camper's innovation to apply Buffon's definition of organic form to the human head *per se*, something overlooked by the Frenchman. Buffon had no pictures of humans in the *Histoire naturelle*, with the exception of pathological conditions or the representation of emotions.[29] His anatomist, moreover, could not distinguish between Asian and French crania.[30] The facial line emerged as the regulative principle for heads in Camper's view because they were materially reshaped by changes in its slant. Ramifications from the facial line's inclination made Camper's theory a Buffonian encapsulation.[31] The fundamental form served as a 'grande vue' ('great view), not immediately apparent, 'par lesquelles nous pouvons embrasser à la fois plusieurs objets différens' ('by which we are able to embrace at one and the same time many different objects').[32]

25 Buffon, 'De la manière d'étudier', 30, 51, 54-55, 57, 62.
26 Buffon, 'De la reproduction', 35, *passim*.
27 Aristotle, *De partibus animalium*, book II, C. 14, 658a35.
28 Visser, *Zoological work*, 145.
29 Hoquet, *Buffon illustré*, 149-154.
30 Camper, *Verhandeling van Petrus Camper*, 19.
31 P. Camper-Buffon, letter draft (August 29, 1786). Special collections, University of Leiden, MS BPL 885.
32 Buffon, 'De la manière d'étudier', 5.

Camper gave the demonstrative line, which had '*om de groote nuttigheid welke zij heeft, in het bepaalen der bijzondere wezens*' ('great utility in the determination of the particular faces'),[33] the name of *linea facialis*. The Flemish anatomist Adriaan van Spiegel (1578-1625) had used this Latin term for 'facial line' as one of four cranial measures.[34] The *linea facialis* remained Camper's exclusive measure that he traced from the front of the incisor teeth to the prominent part of the forehead. The horizon was defined as a line drawn from the nose base to the middle of the ear hole (the future 'Camper's plane' in dentistry). The angle produced from the facial line, intersecting with the horizontal line, provided a specific numerical degree. Camper was the first to quantify the *linea facialis*, and his measurement became known as the 'facial angle'.

The upper jaw's projection governed the head's shape because weight shifted around the line of gravity. This third line was a vertical line running through the ear's aperture. Together the facial line, the horizontal line, and the line of gravity formed triangles, which exposed an architectural law of design in nature. The toothless baby's facial angle measured at 95° and the one-year-old progressed to 100°, whereas the adult regressed to 80° and the toothless elderly person decreased to 78°. Studying a child's physical development, Camper asserted, could reciprocally determine how old people had looked in their youth.[35] He not only found order behind ephemeral forms but a distinct pattern among humanity's global representatives.

Global comparisons

Camper collected a dozen skulls from overseas, necessary because 'zoo vindt men meestal eene trapswijze verandering, welke niet dan op groote afstanden zich kenbaar onderscheidt' ('the gradual change is scarcely to be perceived but by comparing the different extremes').[36] Via an extensive exchange network, Camper arrived at the satisfying moment when he could juxtapose skulls from an exceedingly broad geographical distribution:

> It is worth the trouble to see a row, as I have in my Cabinet, of Monkeys, Orangs, Negroes, of a Hottentot, Malagasy, Celebesian, Chinese, Mogul, of a Kalmyk and of various Europeans, which, placed next to each other on a shelf, immediately reveal the distinctions.

33 Camper, *Verhandeling van Petrus Camper*, 35.
34 A. van den Spieghel, *Opera quae extant, omnia* (Amsterdam, 1645), 16, as cited in Denden, *Die Camperschе Ebene*, 13, 62n29.
35 Ploos van Amstel, 'Berigt', 389.
36 Camper, *Verhandeling van Petrus Camper*, 14.

> Het is de moeite waardig eene rei te zien, als ik in mijn Cabinet hebbe, van Aapen, Orangs, Negers, van eenen Hottentot, Madagascarsche, Celebesch, Chinees, Mogoler, van een Kalmuk en van onderscheidene Europeaanen, welke alle, op een plank naast elkander geplaatst, in eens, de verscheidenheden aan den dag leggen.[37]

This passage is frequently cited in English as evidence of Camper's supposed 'racism'.[38] Thomas Cogan, MD (1736-1818) loosely translated *het is de moeite waardig* with 'it is amusing to contemplate', colouring it with a mocking tone and thereby a racist frivolity.[39]

Nature's constructions became evident despite the fact that three of Camper's skulls had lost their mandibles. The human skull consists of two compounds, the cranium and the mobile mandible (lower jaw). Camper was primarily concerned with the maxilla (upper jaw) contained in the cranium. He had a mandible-less *Cranium Aethiopici Adolescentis* (young Angolan), a *Cranium Aethiopici Angolensis* (Angolan), and two samples of a *Cranium Aethiopici Junioris Madagascar* (young Malagasy). In 1775 he received a *Vetulae Hottentotae* (female Khoisan head with hair and flesh damaged by venereal disease).[40] Of his three *Cranium Javanensis* samples, one had to have been a Celebesian and another one a Moluccan.[41] Since 1774 he had owned a *Cranium Chinensis ex Batavia* (Chinese from Indonesia) in his prime with a facial angle of 75°. In 1785 he obtained an 'Asian' sample that may have been Chinese: 'j'ai su attrapper un crâne d'un Asiatique superbe, ce qui fera une série complette des crânes de différentes nations' ('I've managed to get a superb Asian cranium, which will complete the series of different nations' skulls').[42] The mandibles were missing from his *Cranium Mongollensis* (Mongol), which he also called *Mogoller* (Mogul), and *Cranium Calmuckensis* from Siberia. He supplied the Kalmyk with an elderly African's mandible. In 1788, Camper succeeded in buying a *Cranium Americani Labrador*, which, according to his son, was Inuit.[43] Shortly before his death, he drew a Javanese girl's cranium that had an exceptional facial angle of 54°.[44]

To minimise labour and cost, Camper only had three human skulls engraved. The Angolan he had dissected in 1758 symbolised Africa: *Kaffers* (Bantu), *Hottentots* (Khoisan), and Malagasy. At the time when he procured

37 Camper, *Verhandeling van Petrus Camper*, 47.
38 For example, Schiebinger, *Nature's body*, 149, 253n24.
39 Camper, *The works of the late Professor Camper*, 50.
40 H. Lesueur-P. Camper, letter (May 30, 1775). Special collections, University of Amsterdam, MS X 82b.
41 Camper, 'Kort berigt (…) Orang Outangs', 35. Schiebinger, *Nature's body*, 254n32.
42 Camper & Camper, *La correspondance*, 139.
43 A.G. Camper, 'Beschrijving', 72.
44 *Catalogus van de tentoonstelling*, 36-37.

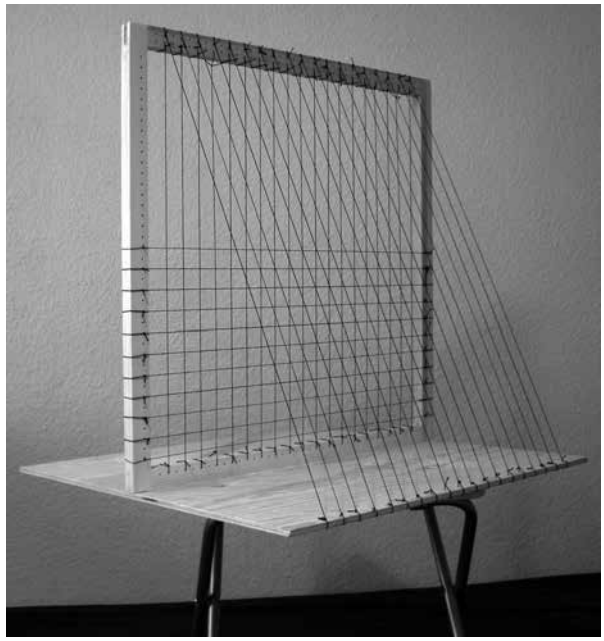

Fig. 1 *Reconstruction of Camper's threaded drawing frame*. M. Jank, *Die Genese craniologischer Messmethoden vom Ende des 18. Bis zur Mitte des 19. Jahrhunderts*, MA thesis (Jena, 2008). Image © M. Jank.

a Kalmyk's skull, the only published Kalmyk cranium was the one Jan Wandelaar (1690-1759) had engraved for the 1743 Leiden dissertation of Johann Benjamin von Fischer (1720-1759/1760), whose father had visited Siberia.[45] Camper completed his drawings in 1772, two years before he acquired a Chinese skull. The Kalmyk, a Tatar people like the New World's natives who descended from Tatar migrants,[46] represented both America and Asia, including Siberia all the way to New Zealand. The European skull stood for Europe, Turkey, Persia, and Arabia's largest part, as far as Hindustan. Natives of the recently discovered South Seas islands were too insufficiently known to be incorporated, although Camper drew a Polynesian skull in Oxford. It greatly resembled the Chinese, of whom he saw a living representative in London in 1785.[47]

Camper did not measure skulls directly but used a threaded drawing window (fig. 1).[48] Visual accuracy had less to do with quantification than with the attempt to make qualitative observations more exact. Camper replaced the distortions of vanishing-point perspective with the objectivity customary

45 Fischer, *Dissertatio osteologica de modo*; Vermeulen, *Early history*.
46 Camper, *Verhandeling van Petrus Camper*, 15.
47 Appleton, *A cycle of Cathay*, 134-136.
48 Karliczek & Jank, '*Umzeichnung*', 57-79.

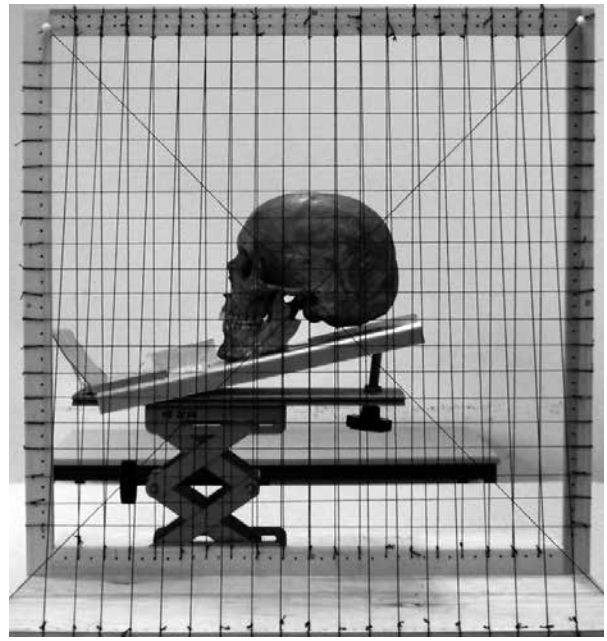

Fig. 2 *A human skull placed in the threaded drawing frame based on Camper's device*. Karliczek & Jank, '*Umzeichnung*', 57-79. Image © M. Jank.

in architecture. To avoid perspective-induced foreshortening, the draftsman's one eye had to move in a plane parallel to the object guided by the drawing frame (fig. 2). If the optical axis remained at right angles to the object, the observer's influence was divested from the actual substance's representation. Camper's topographic studies of the arm, pelvis, and groin applied an original methodology to illustrate their anatomy.[49] Topographical anatomy, drawings from which the dimensions of the original and the specific relations of component parts could be read exactly, had a pedagogical utility.

For the facial angle, Camper used this same architectonic method to draw representative crania in true size and then scaled them in half. He projected not only the profiles of a tailed monkey, orang-utan, African, Asian, and European, but also the casts of Roman and Greek statues. Next he portrayed the same orang-utan, Angolan, Kalmyk, European, and the classical Apollo in full face, followed by a series of diverse human ages in profile and another in full face. For the profiles he drew fleshy parts for the crania and skulls for the statues.

49 Camper, *Demonstrationum anatomico-pathologicarum liber primus*; Camper, *Demonstrationum anatomico-pathologicarum liber secundus*; Camper, 'Verhandeling (…) breuken', 235-265; Hussem, 'Aanmerkingen'; plates III-IV were Camper's drawings. Daniëls, *Leven*, 52, 90, 98.

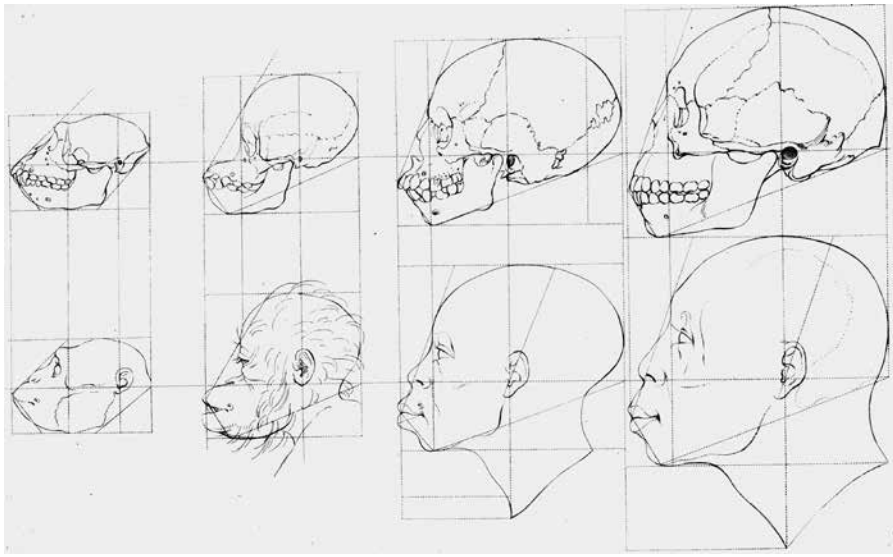

Fig. 3 Reinier Vinkeles (after a drawing by Petrus Camper from 1768), *The profiles of a tailed monkey, orang-utan, Angolan, Kalmuk, and their facial angles*, 1785. Engraving. Camper, *Verhandeling van Petrus Camper* (Utrecht, 1791), Table I. Amsterdam, Amsterdam University Library. Image © Amsterdam University Library.
42° – tailed monkey; 58° – orang-utan; 70° – Angolan; 70° – Kalmyk.

A hypothetical form between the European and the Roman statue was inserted to reduce a 15° gulf. Among adults, facial angles higher than 80° were 'naar konstregels gemaakt' ('formed by the rules of art alone').[50] Roman artists had limited themselves to 95° whereas the Greeks favoured 100°. The Amsterdamse Stadstekenakademie owned a cast of the Pythian Apollo.

Geometrical constraints

At the Amsterdam drawing academy, Camper delivered a total of nine lectures that became the facial angle treatises. Cornelis Ploos van Amstel (1726-1798) summarised the first two 1770 lectures, 'Over de merkteekenen van het verschil des ouderdoms, en die der onderscheidene natien' ('On the characteristics of the difference between ages and those between the various nations') and 'Over het schoone der antieke weezens, en over een nieuwe methode van

50 'Naar konstregels gemaakt'. Camper, *Verhandeling van Petrus Camper*, 38.

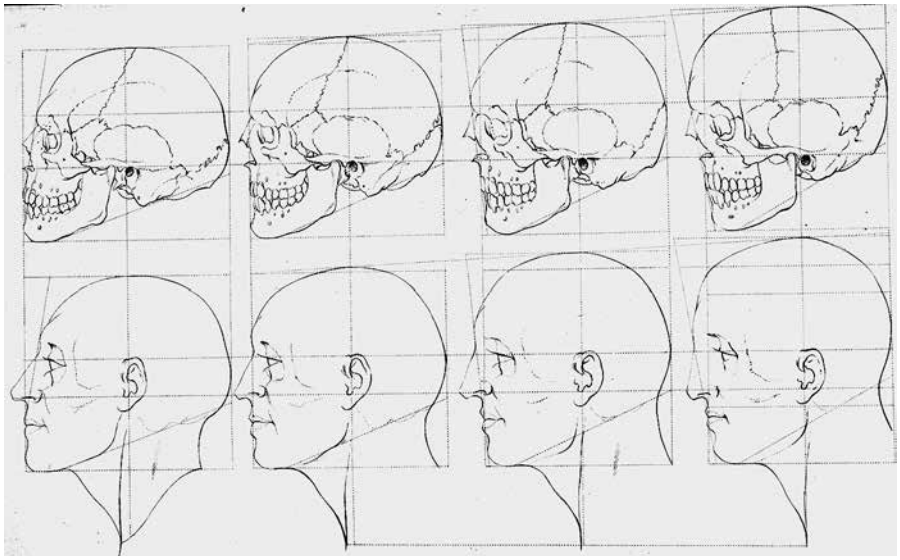

Fig. 4 Reinier Vinkeles (after a drawing by Petrus Camper from 1772), *The profiles of a European and an Antique statue, and their facial angles*, 1785. Engraving. Camper, *Verhandeling van Petrus Camper* (Utrecht, 1791), Table II. Amsterdam, Amsterdam University Library. Image © Amsterdam University Library.
80° – European; 90° – European-classical hybrid; 95° – Roman bust; 100° – Pythian Apollo.

teekenen' ('On the beauty of the antique faces and on a new method of drawing'), in an immediate publication.[51] In his German translation of Ploos van Amstel's report, Johann Fredrik Mauritz Herbell (1752-1819) neglected to indicate that Camper was not the author, something that has caused confusion.[52] Eventually the full texts of Camper's 1770 lectures were published by his son in 1791. A second posthumous book, published a year later, contained the two 1774 lectures 'Over de wyze, om de onderscheidene harts togten op onze wezens te verbeelden' ('The manner of delineating the different passions'), the two 1778 lectures 'Over the overeenkomst tusschende viervoetige dieren, de vogelen en de visschen, enz. enz.' ('On the points of similarity between quadrupeds, birds, and fishes'), and the three 1782 lectures 'Over het gedaante schoon' ('On physical beauty').[53]

51 Ploos van Amstel, 'Berigt', 386-393.
52 Visser, 'Die Rezeption', 325-335.
53 Camper, *Redenvoeringen*, 1-18, 19-54, 57-95 (respectively). Cogan, *The works of the late Professor Camper*, did not translate the physical beauty lectures.

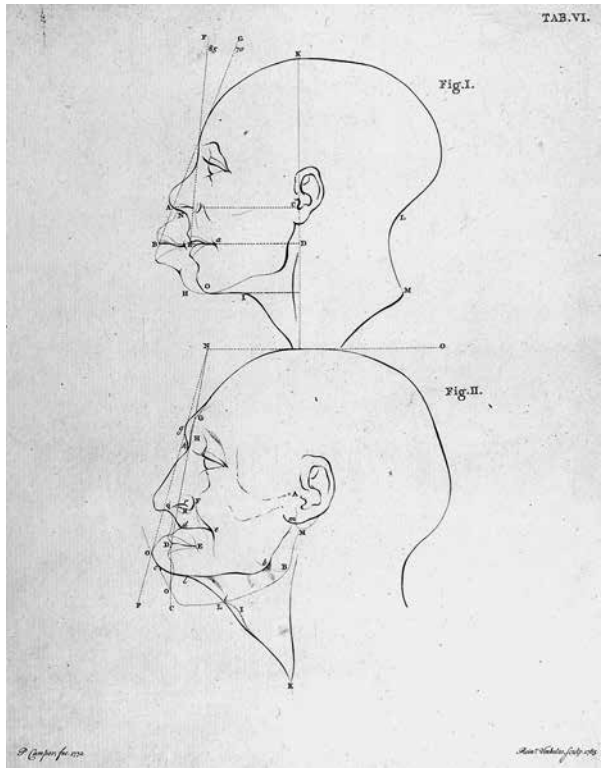

Fig. 5 Reinier Vinkeles (after a drawing by Peter Camper from 1772), *The profiles of an African and a European metamorphosed into one another (at the top) and the profiles of a middle-aged man and an old man metamorphosed into one another (below) to illustrate the principle of the facial angle*, 1785. Engraving. Camper, *Verhandeling van Petrus Camper* (Utrecht, 1791), Table VI. Amsterdam, Amsterdam, University Library. Image © Amsterdam University Library.

Camper morphed profiles drawn in chalk by changing the facial line, causing his audiences to applaud from wonder.[54] A European in his prime with a facial angle of 80° became a toothless old person at 78° yet slipped as easily into an African at 70° (fig. 5). Tilting the *linea facialis* backwards more and more resulted in various protruding mammalian snouts to the flattest of bird beaks.

In contrast, leanings higher than a right angle created profiles of classical antiques. In noticing how the 'Ouden schijnen op het Characteristijke der Neger wezenslijnen vrij oplettend geweest te zijn' ('Ancients seemed to have paid great attention to the facial line for the Negro's Characteristics'),[55] Camper concluded that he had recovered something already known to ancient naturalists and artists. Aristotle had described how species varied just through

54 Ploos van Amstel, 'Berigt', 390.
55 Camper, *Verhandeling van Petrus Camper*, 37.

their parts differing in proportional 'excess and defect'.[56] The obtuse facial angle elongated the Apollonian head, giving it an elevated crown but a small back of the head. The forehead and nose formed a continuous line in profile. Such statues had the widest space between their eyes – more than a European would. These unnatural dimensions, Camper concluded, compensated for perspectival distortions in the spectator's line of vision. By declaring that the purge from optical impurity perfected classical statues, Camper located their beauty 'within criteria of scientific values'.[57]

Superimposing the African's facial line upon a European's illustrated that the African nose was not so much squashed as it was embedded in a forward-jutting upper jaw. With the fore-teeth's projection, the upper lips had to stretch farther, and were thickened and broadened. The European's face was an inverse correlation from the African's. Retreating jaws forced long and narrow noses to project further than the upper lip, creating the distinct nasal-bone absent in both canonical statuary and non-Europeans. Nasal shapes were geometrical consequences of the upper jaw.

Despite sharing the same 70° facial angle, the Kalmyk and Angolan were opposites in full face. Wide jaws caused Asian cheekbones to project, made their faces the flattest of all peoples, narrowed the space between their eyes, and lowered the eye sockets, causing them to be more oblique and consequently stretching their eye muscles. Not only did Kalmyk eyes approach each other the closest, but they also had humanity's broadest skull in full face, whereas Africans had humanity's narrowest skull and Europeans fell in between.

Buffon's mistakes

To Camper, Buffon's explanation for African features was pure nonsense. From narrations by Jacques Le Maire (1585-1616), Father Pierre du Jarric (1566-1617), and Father Jean-Baptiste Du Tertre (1610-1687), Buffon reported an ingenious speculation:

> The Negro women almost always carry their infants on their backs while they work. To this custom some travellers ascribe the large bellies and flat noses common among Negroes. In her raising and stooping with jerks, the mother is apt to strike the child's nose against her back. In order to avoid the blow, the child keeps his head back by pushing the belly forward

56 Aristotle, *Historia animalium*, Book 1, C. 1, 486b19.
57 Grindle, '*Our own imperfect knowledge*', 144.

> Les Nègresses portent presque toûjours leurs petits enfans sur le dos pendant qu'elles travaillent; quelques voyageurs prétendent que c'est par cette raison que les Nègres ont communément le ventre gros & le nez applati; la mère en se haussant & baissant par secousses, fait donner du nez contre son dos à l'enfant, qui pour éviter le coup, se retire en arrière autant qu'il le peut, en avançant le ventre.[58]

Camper objected that the 'schok tegens den rug van de Moeder kan ten anderen den kraakbeenigen neus wel een weinig plat drukken, maar de gaten niet zijdelings en regelmatig verwijderen' ('jerk against the Mother's back can, on the other hand, perhaps flatten the cartilaginous nose a bit, but could not enlarge the nostrils sideways and symmetrically').[59] Such evenness, he argued, could derive only from internal formative forces.

Buffon was the first to study humankind as a species in his *Variétés dans l'espèce humaine* (On the varieties of the human species).[60] Camper's notes on this 1749 essay are preserved in a 1768 manuscript.[61] He copied out Buffon's conclusion, 'Que (…) les traits des visages [dépendent] où sont les differens peuples de s'écraser le nez, de se tirer les paupières, de s'allonger les oreilles, de se grossir les lèvres, de s'aplatir le visage, &c.' ('that (…) features depend greatly on the customs which different peoples practice in flattening noses, stretching eyelids, lengthening ears, thickening lips, flattening faces, etc').[62] He then summarily dismissed this explanation as complete fiction. Racial characteristics were not incidental coercions but the mathematical correlations and constraints of a sustained volume. In fact, foreign crania had enlightened Camper about his countrymen's physical shortcomings:

> All of this is easily explained when the Kalmyk head is examined (…) the broader the jaw, the greater it increases this distance, and, conversely, with us the jaw is extremely narrow and the mouth small.
>
> Tout cecy s'explique facilement quand on examine la tete du Calmuque (…) plus que la machoire est large plus cette distance engrande et par consequente aussi la bouche dans nous la machoire est fort etroite, et la bouche petite.[63]

The upper jaw's retraction determined a small mouth which could crowd or overlap teeth when it proved too small for the teeth nature intended:

58 Buffon, 'Variétés', 458-459.
59 Camper, *Verhandeling van Petrus Camper*, 54.
60 Buffon, 'Variétés', 371-530.
61 Camper, *Excerpta circa faciemus diversas formas* (1768). Special collections, University of Leiden, MS BPL 247.128.
62 Buffon, 'Variétés', 480.
63 Camper dropped the French accents. P. Camper, *Excerpta*, 2. Special collections, University of Leiden, MS BPL 247.128.

> In our provinces the teeth stand yet most uneven, because, through a singular influence from our regions and climates, the maxillae, the upper as well as the lower, are considerably narrower than our cranial cavity, and therefore have too little space to contain all the teeth, that meanwhile have the same breadth as in the warmer countries. They accommodate themselves, after teething, as well as they can, slanting, then behind each other, etc. In Asia, in Africa they have room because the jaws fill out much wider and exceed there once more as a general rule.
>
> In onze gewesten staan zy, met dat alles, meest oneffen, om dat, door een zonderlingen invloed van ons land- en luchtstreek, de kaaken, zoo boven als onder, merkelyk smaller zyn, dan ons hoofdshol, en dus te weinig ruimte hebben om alle de tanden te bevatten, die onderwylen dezelfde breedte houden, als in de warmer landen. Zy schikken zig, naa de verwisseling, zoo goed zy konnen, dan schuins, dan agter elkanderen, enz. In Asie, in Africa staan ze ruim, om dat de kaaken veel breeder uitgroejen, en wederom daar in den algemeenen regel te buiten gaan.[64]

Sunnier climates corresponded with optimal mandibular and pelvic dimensions – from vitamin D, unbeknownst to Camper.

Camper assailed the age-old notion that 'women shaped the race' – that mothers, midwives, or wet-nurses contrived certain physical characteristics postnatally.[65] Since antiquity it was known that particular head shapes could be moulded by pressure on the neonate's soft skull. Camper drew two artificially shaped skulls in English collections to verify by their superimposition that the volume lost from the forehead's flattening was indeed compensated by the cranium's elongation. For some time he had not opposed the 'artifice' argument supported by authorities like Buffon, that human intervention created racial features. But in 1756 Camper received empirical evidence that African features were congenital – in the form of a six-month-old foetus, in which 'alle de trekken zoo zigtbaar zijn, dat een ieder, schoon de kleur van het vel nog niet zwart is, dit voor een Negerkind moet aanzien' ('all the features were so strongly marked, that every person could immediately distinguish the Negro child, although the colour of the skin was not [yet] changed into black').[66] Camper did not deny that artificial modifications occurred but argued that this explanation was untenable for racial diversity.

Attributing racial traits to art alone implied that they were too ugly to be natural. Here Camper acknowledged 'aesthetics' by recognising that people responded with feelings or irrational perceptions. Notions of incorrect features arose from discomfort, due entirely to the lack of familiarity. People loved what they were accustomed to or what they had been taught. Never-

64 [Camper,] *Oplossing*, 131-132.
65 Schiebinger, *Nature's body*, 140-141.
66 Camper, *Verhandeling van Petrus Camper*, 23.

theless, foreign surface appearances were determined by interior processes, not from external pressures, as with manmade artefacts.

Racial birth

Why was body modification such an issue? The origin of racial characteristics had a peculiar significance to early modern Europeans. To them, customs like foot binding and other beautification practices indicated that non-Europeans had ridiculous concepts of beauty. Deliberate disfigurement, moreover, was blasphemous. Implicit connections, dating back to Plato, were often made between physical beauty and virtue, or ugliness and vice (*schoon* meant both 'beauty' and 'purity'). In Christianity, human failings had marred originally perfect nature.

For the precise connotation of temporal and spatial movement away from the true and original type, Buffon employed the term *dégénérer*.[67] *De* (from) and *genus* (original stock) meant the variability from the ancestral form under the impact of time, temperature, and nutrition. The variation was 'not simply individual and random, but determinate in direct response to factors related to geography and climate' having a microcausal influence via the food on the *moule intérieur*, the inner mould that ensured the constancy of species.[68] 'Degeneration' proponents had to determine which human variety had mutated from which variety. Europeans envisioned Adam and Eve to be in their own image.

Buffon based the primordial colour on the logic that black people could procreate white whereas whites never bore black children. The anomaly of albinism permitted an extrapolation to creation on the premise that the pigmentation of these children was trying to revert to its historical, 'pristine' colour.[69] Only late in the eighteenth century did Europeans explicitly state that albinos existed among themselves. Despite one discreet reference to whitish Europeans, Buffon insisted that albinism occurred only in the Torrid Zone.[70] It took a decade before he acknowledged that albinos were also born in temperate latitudes.[71]

Camper's unconventional claim, that the skin colour of the original human couple was impossible to determine, derived from direct evidence. He dissected an Angolan boy on November 14, 1758; an elderly black man on April 16,

67 Buffon, 'Dégénération', 311-374, *passim*.
68 Sloan, 'The idea of racial degeneracy', 303.
69 Buffon, 'Variétés', 502.
70 Buffon, 'Dégénération', 324.
71 Buffon, 'Sur les blafards', 569-570.

1766; a young black male on April 17, 1768; and a biracial man (with a black mother and white father) on November 9, 1768.[72] This was a large number for one decade; only 38 dissections of blacks have been documented in all of Europe for 1675-1810.[73] On November 14, 1764, and April 6, 1766, Camper used preparations like a 'Moor's head', a black foetus, black skin, skin from a hand, an Italian sailor's tattooed skin, a white woman's skin, and a piece of scarred skin.[74] His lecture, *Redevoering over den oorsprong en de kleur der zwarten* (Oration on the origin and colour of blacks), was published in a short-lived journal, called *De Rhapsodist*. Camper's conclusion – 'Adam could have been created black, brown, tanned or white'[75] – made his essay 'one of the earliest and most uncompromising treatises against colour discrimination'.[76]

While he himself never travelled beyond northern and central Europe, Camper indicated that black people were not uncommon in Holland. In the first half of the eighteenth century, the most important anatomical work on black skin took place in the Dutch Republic.[77] Some had claimed that blacks had an extra skin layer because the 'Malpighian layer' was easier to discern in Africans.[78] Through slow maceration of skin layers, Dutch anatomists Frederik Ruysch (1638-1731) and Bernhard Siegfried Albinus (1697-1770) proved that whites had the same reticular membrane. The layer discovered by Marcello Malpighi (1628-1694) existed in everyone regardless of their colour. Underneath that tissue the proper skin was white in everyone, evident in skin injuries like pockmarks, scars, or burns. Since the outermost skin layer was transparent, pigmentation rested only in the intermediate layer:

> When this second layer is completely without colour, then we are very white and pale: that is to say, we are white Moors, or rather; we are people similar to Blacks in every way except that we have this middle layer less tanned.
>
> Wanneer dit tweede vlies geheel zonder kleur is, zyn wy zeer wit en blank: dat is te zeggen, wy zyn witte Mooren, of liever wy zyn menschen in alles gelyk aan de Zwarten, alleenlyk hebben wy dit middelvlies minder getaand.[79]

72 P. Camper, 'Inleiding tot de openbare lessen over de ontleding van spieren en ingewanden, gehouden te Groningen' (Nov. 29, 1763-April 6, 1768), 21-40, 117-124. Special collections, University of Amsterdam, MS II F 71.
73 Mazzolini, 'Für eine neue Geschichte', 327.
74 P. Camper, 'Inleiding tot de openbare lessen over de ontleding van spieren en ingewanden' (November 14, 1764), 33, 36-38. Special collections, University of Amsterdam, MS II F 71.
75 'Laat Adam zwart, laat hy bruin, getaand of wit geschapen zyn'. Camper, 'Kleur der zwarten', 393.
76 Bindman, *Ape to Apollo*, 204; Meijer, *Race and aesthetics*, 183-192.
77 Mazzolini, 'Anatomische Untersuchungen', 175.
78 Mazzolini, 'Frammenti', 426-432.
79 Camper, 'Kleur der zwarten', 391.

In calling his fellow Europeans *witte Mooren* (*Leucaethiopians*, 'white Ethiopians' in classical Greek literature), Camper reflected a global perspective. He concluded that 'wy zullen zwart zyn, dog meerder of minder' ('we are all black more or less').[80] Pigmentation shades, like facial angles, were but a matter of degree.

Albinus, Camper's teacher, had observed that neither race had their colour evenly distributed. Both had yellowish tints in their palms and foot soles, and darkened areas in the private parts.[81] Camper observed that sometimes 'die middenhuid (…) bij onze zwangere Vrouwen zomwijlen even zwart wordt, als in de zwarste Angoleesche Negers' 'the middle skin (…) in our pregnant Women becomes as black as in the blackest Angolan Negroes').[82] If black people occasionally blanched because of albinism or vitiligo, white people could darken during pregnancy or severe hunger – hence the Dutch proverb: 'zwart van magerheid te zyn' ('to be black from emaciation').[83] Since no colour could be granted precedence over another, Camper concluded that 'het om het even is, of Adam en Eva zwart of wit geweest zijn, aangezien de verandering van blank tot zwart even groot is als van zwart tot blank' ('it is immaterial whether Adam and Eve had been black or white, seeing that the change from white into black is equally as great as that from black into white').[84] Reciprocity was significant in a society where precedence signified superior rank. Why did Camper present a less Eurocentric opinion here than his French mentor?

Dutch East Indies

Camper's Dutch parents had lived in Indonesia. Perhaps they were either more acclimatised to non-whites or conscious of whites' minority status in world demography? Born in Surat, India, Camper's mother was baptised in Batavia (present-day Jakarta) on Java.[85] Florentius Camper (1675-1748), working as a Dutch Reformed Church minister in 1702-1712, met and married Sara Geertruida Ketting (1689-1748) in Batavia. Petrus Camper's claim that 'de Vrouwen, die van Hollandsche, of Engelsche Ouders, in Asië geboren waren (…) die breede kaaken maakt, welke wij nimmer bij andere Natiën zien' ('women born in Asia of Dutch or English Parents (…) have broader

80 Camper, 'Kleur der zwarten', 375.
81 Albinus, *Sede et caussa coloris aethiopum*.
82 Camper, *Verhandeling van Petrus Camper*, 16.
83 Camper, 'Kleur der zwarten', 392.
84 Camper, *Verhandeling van Petrus Camper*, 16.
85 A.G. Camper, *Notices bibliographiques sur la vie de Petrus Camper*, MS Mary Camper-Titsingh, donated to the University of Groningen in 1989.

mandibles than other nations')[86] may have been a testimony to his mother's healthy teeth.

In the East Indies, Camper's father witnessed a live orang-utan, one of Europe's most discussed yet least known animals. His clerical colleague, François Valentijn (1656-1727), who translated the Bible into the Malay language, cited the event:

> Also Orang Hoetans, or people of the forest, are found here [Borneo], a kind of rare ape that walks erect and in all parts have the shape and habits of a human, and only speech is lacking. I have seen two alive, the last with Mr. Camper, Lord of Ouwerkerk aan de IJssel, who still has the specimen in his possession (as far as is known), now in a jar of spirits at his home in Leiden.
>
> Ik hebbe van die Aapen gezien (…) Orang Hoetans, of bosch menschen, een soort van zeldzaame Aapen, die regt over eind gaan, in allen deelen de gedaante en manieren van een mensch hebben, en aan de welke niets, dan de spraak ontbreekt. Ik heb 'er twee leevende van gezien, en de laatste by den Heer Camper, Heere van Ouwerkerk aan de Yssel, welke zyn Eerw., tot Leyden woonende, nog (zoo niet beter weet) in een fles of pot in liqueur te zien heeft. [87]

Orang meant 'man' and *outang* 'forest' or 'bush' in Malay.[88] In 1641, the Dutch physician Nicolaas Tulp (1593-1674) called the chimpanzee that arrived alive in Holland from Dutch-occupied Angola *orang-utan*.[89] Thereafter the Malay was used as a generic name for the known apes, with complete confusion between the chimpanzee and the orang-utan (the gorilla was not introduced to Europe until the mid-nineteenth century).

Buffon divided the *Orang-outangs* into two varieties: the small 'orang-outang' or *jocko* and the large one or *pongo*, African words for 'beast'. Buffon knew the *pongo* only from travellers' accounts, but he himself saw a two-year-old *jocko* walk upright in Paris.[90] In concluding that only its lack of thoughts prevented the little ape from speaking, Buffon resorted to Cartesian dualism. The *jocko*'s anatomy in the *Histoire naturelle* was based on Tyson's book due to the condition of the *Cabinet du roi* specimen.[91] Although specimen no. 1291 was the same ape Buffon witnessed in 1740, Camper was shocked by the taxidermied *jocko* he saw in Paris in 1777.[92] Buffon's draftsman had enhanced

86 Camper, *Verhandeling van Petrus Camper*, 19.
87 Valentijn, *Oud en nieuw Oost-Indiën*, vol. 3/2, 242.
88 The Smithsonian National Zoo in Washington, DC, which has a 'Think Tank' for their orang-utans, now uses 'orang utan' instead of 'orangutan' to be truer to its linguistic roots.
89 Tulpius, *Observationes medicarum*, 274.
90 Buffon, 'Les Orang-outangs', 52-55.
91 Daubenton, 'Jocko', 72.
92 Daubenton, 'Description de la partie du Cabinet', 130. J. Martínez-Contreras of Mexico City's

the small, ugly, seated, stuffed chimpanzee into an elegantly standing adult with a walking stick.[93] Anthropomorphising apes was not only dishonest but offensive to human dignity. Camper asked the French to correct their data about the true orang-utan in a forthcoming supplement, but the rectifications after Buffon's death gave him no credit.[94]

The more reliable reports about apes came from Dutch physicians, cabinet directors, or employees of the Dutch East India Company. The East Indies made the Dutch Republic's eighteenth century a veritable 'century of the orang utan'.[95] Jacob de Bondt, MD (1592-1631) had publicised the myth of Borneo's interior natives that orang-utans refused to speak for fear of enslavement and were also bipedal.[96]

Camper became the first European to dissect the East Indian orang-utan. Thanks to his correspondents in Dutch colonies, many of whom were former students, he bought a specimen in 1770. A live orang-utan infant in the Stadtholder's menagerie survived from June 29, 1776, until January 22, 1777. Camper observed her and other small specimens, including his father's pickled orang-utan, and he dissected five of them.[97] In 1770 and 1771 he performed public dissections of two females that Dr. Johann Paul Hoffmann, Batavia physician, and John Hope (1737-1784), a VOC director, had each sent him. Twice he dissected females received from Arnout Vosmaer (1720-1799), director to the Stadtholder's zoo and cabinet. His third private dissection on a male orang-utan that belonged to Cornelis van Hoeij (1717-1803), a senator, took place in 1777. Camper examined a preserved female orang-utan from Willem van de Meulen, a wealthy Amsterdam merchant; a stuffed male that Jean Nicolas Sébastien Allamand (1713-1787) supplied from the University of Leiden; and a bottled female belonging to Stadtholder Prince William V (1748-1806).[98] Camper's motives had less to do with *menschkunde* (anthropology) than with identifying Galen's simian sources.

Universidad Autónoma Metropolitana photographed Buffon's *jocko* specimen in the Muséum National d'Histoire Naturelle de Paris. Martínez-Contreras, 'Les primates', 332-333.

93 Daubenton, 'Jocko', 82, plate 1.

94 Meijer, 'Une collaboration', 100, 101n1. The latter footnote is incomplete. Buffon [Lacépède], 'Addition à l'article des Orangs-outangs', appeared in the *Histoire naturelle supplément* 7 (1789) on pages 1-29. Pages 6-22 were cited from Allamand, 'Addition à l'article des Orangs-outangs', vol. 34 or suppl. 5. Count de Lacépède's pages 22-29 came from Vosmaer, 'Description de l'espèce de singe aussi singulier que très rare, nommé orang-outang, de l'isle de Borneo', in his *Description d'un recueil exquis d'animaux rares*. Camper was acknowledged in the original articles.

95 Meijer, 'Une collaboration', 85n6.

96 Bontius, *Historiae naturalis*, 84-85. There is also a Dyak story where a child was born from relations between a woman and an orang-utan male; Martínez-Contreras, 'Les primates', 335n2.

97 Meijer, 'The century'.

98 Camper, *Natuurkundige verhandelingen over den orang-outang*, 12, 19, 26-30; Daniëls, *Leven*, 22n71.

By 1770 he had found all of the Greek dissector's sources except for a larynx with two pouches. Fortunately the speech organs of all five orang-utan dissections matched Galen's description. The orang-utan's paired lateral sacs, and skeletal structure, sealed the evidence that the ape was a mute quadruped. Camper's *Natuurkundige verhandeling over den orang-outang en andere aap-soorten* (Essay on the natural history of the orang-utan and other simian species) thoroughly dehumanised the manlike ape. The original Malay name, he advised, should be reserved exclusively for the 'real' orang-utans. They derived from Borneo, had reddish hair and heads set into their shoulders, with long, very lean arms and legs, and no nails on their big toes. Camper's only direct experience with the chimpanzee had been with the French king's specimen. But the black apes of Buffon, Dr. Tulp, and Dr. Tyson all came from Angola, had all of their toenails, and were represented as beefy and muscular, with short arms. Nevertheless, physical signs of immaturity had characterised all the anthropoid apes in Europe up until then.

In 1779, the first orang-utan as tall as a human being was captured by Willem Adriaan Palm on Borneo.[99] Frederik von Wurmb (d. c. 1782) published its measurements.[100] Large apes became known as 'Wurmb's *pongo*', like the skeleton Napoleon's army stole from the Stadtholder's collection.[101] When Camper received the skull of a large Borneon ape towards the end of 1783, he too named it *pongo* to distinguish it from the *kleinen Orang Outang* (small orang-utan). The enormous changes the orang-utan underwent in maturation, especially in the head, were not recognised as such by Camper. He wrongly concluded that the large orang-utan represented another species, whereas Buffon had guessed correctly that it might be an adult form.[102] Camper classified his single *pongo* specimen as a separate species. To further emancipate human anatomy from apes, he juxtaposed or superimposed the profiles of the African human and the genuine orang-utan to demarcate the facial line difference of 12°.

Racist image

Camper's most lasting legacy proved to be the two facial angle engravings of profiles. The almost fortuitously assembled triad of simian, human, and statue developed into a 'central visual icon of all subsequent racism'.[103] With the Af-

99 De Radermacher, 'Beschryving van het eiland Borneo'.
100 Von Wurmb, 'Beschrijving van de groote Borneoosche orang outang'.
101 This skeleton resides in the Muséum National d'Histoire Naturelle de Paris; Barsanti, 'L'Orang-outan déclassé', 85.
102 Buffon, 'Orang-outangs', 51.
103 Schiebinger, *Nature's body*, 149-150.

rican placed next to the ape and the European next to canonical beauty, the profiles appeared to reinforce a static chain of being; a race ranked lower the further it departed from the 'ideal' human form. Racial intelligence was linked to flattened foreheads[104] although the angle's determinant was not the braincase – a constant for Camper – but the upper jaw.

Even during craniology's popularity, Camper's texts were seldom read.[105] D'Arcy Wentworth Thompson (1860-1948), for instance, never realised how much his 'transformations' resembled Camper's 'metamorphoses'. Thompson assumed that the facial angle was a Cartesian network of coordinates.[106] Camper's biographer, C.E. Daniëls, appreciated his holistic insights for surgery but never in the facial angle context:

> Beyond many of his contemporaries Camper considered the context of the mutual parts as one of the most outstanding [anatomical] problems, the solution of which was of the greatest benefit to the scientific anatomist [for] only through that could he get a good idea of the influence that the different parts exert upon each other [and] of the sum total that is created from their concerted action.
>
> Hij boven vele zijner tijdgenooten het verband der deelen onderling als een der voornaamste vraagstukken beschouwde, wier oplossing van het grootste nut is voor den wetenschappelijken ontleedkundige, omdat hij daardoor alleen eene goede voorstelling kan verkrijgen van den invloed, dien de verschillende deelen op elkaar uitoefenen, van het eindresultaat dat uit hunne samenwerking geboren wordt.[107]

Daniëls relegated the facial angle theory to the fine arts, even though no rift existed between the sciences and the arts before the nineteenth century.

It is particularly art historians who insist that the facial angle graphics carry an implied racism. Some consider Camper's explanation of optical optimum for ideal beauty to be too simplistic. Yet it was completely consistent with his favouring of topographical anatomy. Optometry – the subject of Camper's two academic dissertations – was behind both judgements. The focus shifted merely from one end of the line of vision to the other. Deliberate distortions, to divest the representation from a subjective perspective, were made for the spectator's sake in canonical statuary but for the object's sake in topographical anatomy.

Could even the highly imaginative (and vain) Camper ever picture the 'pitch of absurdity' to which his facial angle graphics would ultimately be subject?[108] Unintentional reinforcement of racist ideas can occur in the works of any

104 Kemp, 'Slanted evidence', 727. Reprinted as 'Slanted statistics', 84-85.
105 Luyendijk-Elshout, 'The magic of the skull', 571-574.
106 Thompson, *On growth and form*, 226n3, 292n1, 318, 320.
107 Daniëls, *Leven*, 57.
108 Poliakov, *Aryan myth*, 163.

public figure, no matter how contrary his original meaning.[109] It is no longer remembered that the artifice theory 'is door den Heere P. Camper te duidelyk getoond onwaar te zyn, dan dat wy 'er geloof aan zouden slaan, in weerwil van al wat 'er (…) de Buffon (…) van verhaalen' ('was all too clearly demonstrated to be untrue by Mister P. Camper (…) in spite of what has been narrated by (…) Buffon').[110] Paradoxically, Camper's facial angle theory was an outcome of Buffon's new method.

Historical context

The alternative organic view of nature that Buffon introduced mid-century emphasised forms functioning in the economy of the whole and on degrees of relationship. While the Frenchman eloquently described natural processes, verbal statements can convey only so much about shapes. Camper plotted organic nature on a grid by facts which had a sensuous basis but were not readily perceptible. He reduced solids to a simple profile line to translate the formative law into a bi-planar representation.

The closest discipline to Camper's initial context is forensic anthropology, popularised by American television programs like *Bones* and *Law and order*. They use Camper's same landmarks: high-bridged nasal bones characterise the Caucasoid, alveolar prognathism the Negroid, and flat, broad cheeks the Mongoloid 'races'.[111] The principle of correlation, or the compensation of parts, of the skull's invariant volume allow for forensic investigations. Identification of human remains begins with criteria of ethnic ancestry based upon skull shape, of gender upon pelvic size, and of age upon dental development. Camper first spotted morphological patterns while he served as a medical examiner in Amsterdam. He achieved minute comparisons by uniting his graphical talents with his knowledge of anatomy. Today's age-enhanced photos of missing victims, as well as today's medical textbooks' topographical illustrations, are reminders of Camper's powerful originality.

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109 Daybdeen, *Hogarth's blacks*, 74, 121, 130-131.
110 [Camper,] *Oplossing*, 130.
111 Nafte, *Flesh and bone*, 112.

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Petrus Camper in Context

'A meteor of spirit, science, talent and activity' – thus Goethe described Petrus Camper (1722-1789). Goethe's words contain all the elements that make Camper such a fascinating figure in the history of science and the arts in the eighteenth-century Dutch Republic. This volume sheds new light on Camper's versatility, engagement, and charisma in all fields and disciplines he ventured into and published on. It not only addresses his scientific activities, findings, and opinions, but also delves into his careers at the universities of Franeker, Amsterdam, and Groningen, his travels, relationships, friendships, and feuds, as well as the ways he communicated his wide-ranging research. Eleven case studies illustrate Camper's views on eighteenth-century life and society, which motivated not just his scientific, but also his political, societal, literary, and artistic practice. Together they amount to a plea for an integration of all aspects of his scholarly life and persona.

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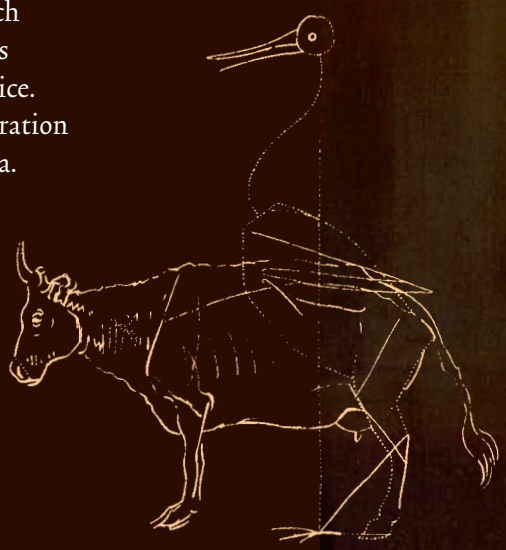

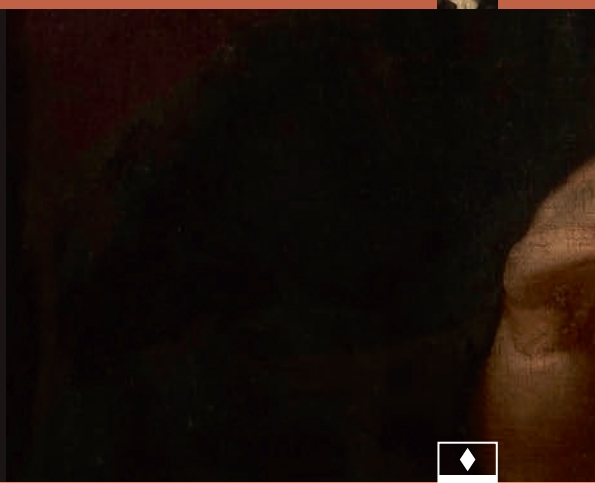
VERHANDELING OVER DEN BESTEN SCHOEN,

door den Heer

PETRUS CAMPER.

Non multum abfuit, quin Sutrinum quoque inventum a Sapientibus diſceret Poſidonius.

SENECA.

INLEIDING.