NOTES AND RECORDS

Notes Rec. (2023) **77**, 575–604
doi:10.1098/rsnr.2022.0014
Published online 5 May 2021

BONES OF CONTENTION: JOHANN HEINRICH MERCK'S PALAEONTOLOGICAL ENCOUNTERS WITH ACADEMIC SCHOLARS AND PROFESSIONAL PRINTMAKERS

by

GRAŻYNA JURKOWLANIEC*

Institute of Art History, University of Warsaw, Krakowskie Przedmieście 26/28, 00–927 Warszawa, Poland

Printed images played a role in the strategies of savant amateurs of the Enlightenment in consolidating their scientific networks, traced here through the case study of Johann Heinrich Merck. Convinced of the importance of his palaeontological findings, Merck developed an impressive network from Johann Wolfgang Goethe and Samuel Thomas Sömmerring to Petrus Camper and Joseph Banks. Academic celebrities set an important horizon for Merck's aspirations, but his ambitions also depended on professional artists. Increasingly disappointed with printmakers' contribution to natural history, Merck eventually emancipated himself as an etcher in his own right.

This article's focus is on printed images regarded as both visual and material sources; both preserved—some neglected hitherto—and those only known via written sources, whose record allows for a detailed reconstruction of events and the intentions behind them. As images used to disseminate knowledge, they were expected to be reliable; as objects employed in the pursuit of scholarly recognition, they were supposed to reach their recipients post-haste. An inspection of Merck's utilization of printed images, with their concomitant demand for reliability and speed, reveals a pattern of misjudgements in his career and a craving for attention and primacy, which repeatedly exposed him to predicaments.

Keywords: scientific illustration; history of palaeontology; natural history; eighteenth-century dilettantism; Johann Heinrich Merck

INTRODUCTION

'It is unbelievable what mischief professional draughtsmen and engravers do to natural history' (*Es ist unglaublich, was unkundige Zeichner u. Kupferstecher von Profession für Unheil in der Naturkunde anrichten*), observed Johann Heinrich Merck (1741–1791) in a letter to the historian Johann Wilhelm Christian Gustav Casparson (1729–1802) of 31 May

*g.jurkowlaniec@uw.edu.pl

1786.[1] The author, a collector and diligent researcher of palaeontological specimens, understood as soundly as any professional the importance of reliable visual sources for natural history. At the same time, his assertion appears an impudent comment, penned as it was by an amateur in the fields of both arts and sciences.

Since its inception in the late eighteenth century, palaeontology had attracted not only professional scientists but also savant amateurs who unfailingly recognized the momentous implications of the new academic discipline. Explorations of fossils inevitably entailed a discussion on the foundations of the traditional paradigms, as epitomized by the idea of 'transformism' that paved the way for the theory of evolution.[2] The discoveries—both spectacular and modest—that underpinned the new concepts required documentation, including reliable depictions. Increasingly intense since the Renaissance, fruitful encounters between practices now typically regarded as distinctive to art and science, respectively, gave birth to a new kind of visual expertise.[3] This also coincided, however, with a growing professionalization in both fields, epitomized by a flourishing number of artisans who specialized not only in scientific illustration in general, but also in its specific branches, such as anatomic illustration, or who worked for particular societies or journals.[4] That leaves the question of how the savant amateurs readjusted to this increasingly normalized world.

One of the most prominent German physicists, Georg Christoph Lichtenberg (1742–1799), believed, if one takes literally his oft-quoted opinion expressed on 30 June 1782, that 'the greatest discoveries have always been made by dilettantes and not by professors'.[5] Indeed, amateur investigators made several significant contributions to Enlightenment science, typically facing a non-trivial dilemma in the process. Should one publish one's findings immediately, and thus unswervingly gain the fame of the discoverer, but at the same time risk that, say, minor errors would undermine the magnificence of the achievement? Or should one consult renowned specialists first, which might entail not only a substantial delay in publication but also a loss of primacy, exclusivity or even authorship itself?

Perhaps the most notable case is that of Goethe's (1749–1832) discovery of the intermaxillary bone in humans. Goethe was convinced he had found a keystone of the essence of humanity; at least that is how he announced his finding to Johann Gottfried Herder (1744–1803) in March 1784, adding, 'Only I beg of you not to mention it, since it must be handled confidentially'.[6] This request for discretion might lead from the momentous implications of the finding. The lack of an intermaxillary bone in humans had until then been regarded as a distinguishing mark between humans and animals, so

1 Johann Heinrich Merck, *Briefwechsel* (ed. U. Leuschner *et al.*), vols 1–5 (Wallstein, Göttingen, 2007), no. 831.

2 Martin J. S. Rudwick, *Bursting the limits of time: the reconstruction of geohistory in the age of revolution* (University of Chicago Press, 2005).

3 Martin J. S. Rudwick, 'The emergence of a visual language for geological science 1760–1840', *Hist. Sci.* **14**, 149–195 (1976) (https://doi.org/10.1177/007327531562492 7); Daniela Bleichmar, 'Learning to look: visual expertise across art and science in eighteenth-century France', *Eighteenth-Cent. Stud.* **46**, 85–111 (2012) (https://doi.org/10.1353/ecs.2012.0084); Dominik Hünniger, 'Visible labour? Productive forces and imaginaries of participation in European insects studies, ca. 1680–1810', *Ber. Wiss.* **44**, 180–210 (2021) (https://doi.org/10.1002/bewi.202100002).

4 Domenico Bertoloni Meli, 'The rise of pathological illustrations: Baillie, Bleuland and their collections', *Bull. Hist. Med.* **89**, 209–242 (2015) (https://doi.org/10.1353/bhm.2015.0034); Sachiko Kusukawa, 'Picturing knowledge in the early Royal Society: the examples of Richard Waller and Henry Hunt', *Notes Rec. R. Soc.* **65**, 273–294 (2011) (https://doi.org/10.1098/rsnr.2010.0094).

5 Georg Christoph Lichtenberg, *Briefwechsel* (ed. Ullrich Joost e.a), vol. 2 (C. H. Beck, Munich, 1985), p. 370.

6 English translation after: Ryan Feigenbaum, 'Toward a nonanthropocentric vision of nature: Goethe's discovery of the intermaxillary bone', *Goethe Yearbook* **22**, 73–93 (2015) (https://doi.org/10.1353/gyr.2015.0012).

Goethe's discovery potentially undermined the foundations of Christian anthropology. Regardless of that, however, Goethe recognized himself as an amateur, so, before announcing his bold theory publicly, he decided to ask specialists for a peer review.[7]

Goethe's candidates for referees were the most recognized German scholars: Johann Friedrich Blumenbach (1752–1840), a professor of medicine and inspector of the museum of natural history in Göttingen, and Samuel Thomas Sömmerring (1755–1830), who was about to move from the Collegium Carolinum in Kassel to Mainz. Goethe also cared for the opinion of Petrus Camper (1722–1789), who laid the foundation for craniometrical research and, as a member of several professional societies, was a celebrity among European scholars. Since he had had no previous contact with Camper, however, Goethe asked a friend to pass on the manuscript. The friend was none other than Johann Heinrich Merck, an admittedly less famous but perhaps more representative figure of the Enlightenment dilettantism.

The rhinoceros skull, or a humble devotee of 'Holy Anatomy'

The councillor of war for Louis IX, Landgrave of Hesse-Darmstadt (1719–1790), but also writer, literary critic, connoisseur of the arts, collector and investigator of fossils and—which brought him to ruin—entrepreneur, Merck was an amateur *par excellence*. Marie-Theres Federhofer has brilliantly embedded his scientific undertakings in various theoretical perspectives on eighteenth-century dilettantism.[8] A no less important foundation for the research on Merck's entanglements in the worlds of academic science and professional printmaking are Ulrike Leuschner's recent editions of his correspondence and collected works—truly impressive publications, exceptionally rich in both detailed findings and contextual information.[9]

Merck discovered his passion for natural history after a visit to Kassel in autumn 1780, where Sömmerring showed him around the local anatomical theatre and menagerie, as subsequently reported in literary magazine *Der Teutsche Merkur*.[10] In Kassel, Merck also probably met another Prussia-born scholar: Georg Forster (1754–1794), who taught natural history at the Collegium Carolinum between 1778 and 1784. No later than 1782, Merck started collecting and studying fossils, noting that the region of Hesse-Darmstadt is particularly rich in remains of ancient rhinoceros and elephants. Having observed that the academic community had not acknowledged these discoveries, Merck decided to enter the scholarly debate.

7 Hermann Bräuning-Oktavio, *Vom Zwischenkieferknochen zur Idee des Typus. Goethe als Naturforscher in den Jahren 1780–1786* (Barth Verlag, Leipzig, 1956 = Nova Acta Leopoldina, NF, vol. 18, no. 126), esp. pp. 111–126; Karl J. Fink, *Goethe's history of science* (Cambridge University Press, 1991), p. 22.

8 Marie-Theres Federhofer, 'Fossilien-Liebhaberei. Johann Heinrich Merck und der naturwissenschaftliche Dilettantismus des 18. Jahrhunderts. Mit drei ungedruckten Briefen Mercks an Sir Joseph Banks', *Lenz-Jahrbuch: Sturm und Drang Studien* **6**, 127–159 (1996); *ead.*, *"Moi simple amateur". Johann Heinrich Merck und der naturwissenschaftliche Dilettantismus im 18. Jahrhundert* (Wehrhahn, Hannover, 2001); *ead.*, 'Paläontologie in Briefen. Johann Heinrich Mercks Korrespondenz mit Petrus Camper', in *Netzwerk der Aufklärung. Neue Studien zu Johann Heinrich Merck* (ed. Ulrike Leuschner and Matthias Luserke-Jaqui), pp. 121–134 (De Gruyter, Berlin, 2003).

9 Merck, *op. cit.* (note 1); Johann Heinrich Merck, *Gesammelte Schriften. Kritische, kommentierte Ausgabe* (ed. U. Leuschner *et al.*), vols 1–8 and Suppl. (Wallstein, Göttingen, 2011–2021).

10 Merck, *op. cit.* (note 9), vol. 5, pp. 203–210.

His most important specimen was the rhinoceros skull currently displayed as 'Merck's Rhino' in the palaeontological exhibition at the Hessisches Landesmuseum in Darmstadt. It is certainly far less spectacular than the main pride of the collection—the famous Peale's mastodon—but it too has played a role in advancing the study of fossils of large mammals. Merck acquired this skull in the spring of 1782, when it was presented to him as the remains of an unidentified animal, although some associated it with the elephant. That is how he must have initially described it to Christoph Martin Wieland (1733–1813), the founder and editor of *Der Teutsche Merkur*, who in April strongly urged him to continue his research and write an article.[11] As it turned out, the article on the specimens from Merck's collection was not to be published in *Der Teutsche Merkur* until the autumn of 1782, as he wished to announce his finding in a separate publication in French first.[12]

Meanwhile, Merck realized that the skull was the remains of a rhinoceros, which he proudly announced to Goethe in July.[13] Merck came to this conclusion after he had read the publication of Peter Simon Pallas, the German botanist and zoologist, member of the Imperial Academy of Sciences and Arts in St Petersburg and professor at the local university. Pallas took part in five expeditions to different areas of the Russian Empire between 1768 and 1774.[14] Among the early fruits of these undertakings was an article presenting the results of the investigation in Siberia, where at the Arctic Sea Pallas discovered, among other things, a rhinoceros skull. Looking at the plates illustrating Pallas's article (figure 1), Merck observed a striking resemblance to his specimen, which was almost equally well preserved. Such an observation undoubtedly deserved to be shared not only with Goethe but also with academic scholars.

Merck described his first findings on the rhinoceros and elephant bones in the *Lettre à Monsieur de Cruse,* […] *sur les os fossiles d'éléphans et de rhinocéros qui se trouvent dans le pays de Hesse-Darmstadt*, or 'Letter to M. de Cruse, […] on the fossil bones of elephants and rhinoceroses which are found in the country of Hesse-Darmstadt', now typically referred to as the 'first *Knochenbrief*', as it was to be followed by two more.[15] The addressee, Karl Friedrich von Kruse (1727–1799), whom Merck had met personally during a trip to Russia in 1773, was a physician to Catherine II and a member of the St Petersburg Academy. Merck's writing, planned from at least 12 August, is dated to 31 August 1782, and it appeared in print as a booklet by 11 September, when Merck sent two copies to Sömmerring with a request to pass one to Camper.[16] Significantly, the date of the letter to Sömmerring has a note 'In a hurry' (*In Eile*). Given the dates, the publication was also printed in a hurry, which had its consequences.

Even before he published the first *Knochenbrief*, Merck had initiated personal contacts with further university professors and members of scientific societies. It must have been in summer 1782 that Merck dispatched his first letters to Joseph Banks (1743–1820), the president of the Royal Society. This epistle remained unanswered, and it allegedly never

11 Merck, *op. cit.* (note 1), no. 517.

12 Merck, *op. cit.* (note 9), vol. 6, pp. 231–235 and vol. 7, pp. 7–13.

13 Merck, *op. cit.* (note 1), no. 527.

14 Peter Simon Pallas, 'De ossibus Sibiriae fossilibus craniis praesertim rhinocerotum atque buffalorum, observationes', *Novi Commentarii Academiae Scientiarum Petropolitanae* **13**, 436–477 (1769), pl. IX.

15 Merck, *op. cit.* (note 9), vol. 6, pp. 214–226. Merck's publications on fossils were first labelled as *Knochenbriefe* by Goethe: Merck, *op. cit.* (note 1), no. 627.

16 Merck, *op. cit.* (note 1), nos. 538 and 545; Merck, *op. cit.* (note 9), vol. 6, p. 522.

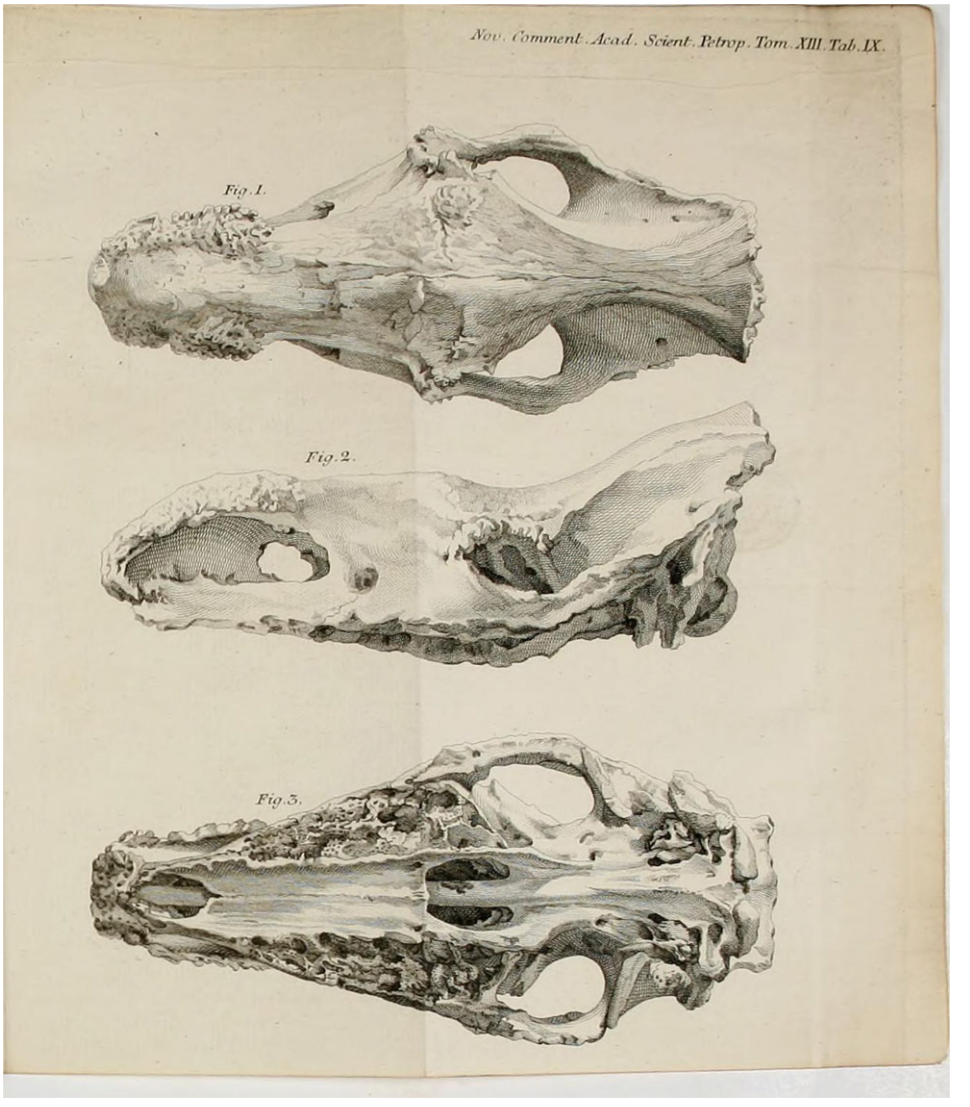

Figure 1. 'The rhinoceros skull found in Siberia', plate IX, in Peter Simon Pallas, 'De ossibus Sibiriae fossilibus craniis praesertim rhinocerotum atque buffalorum, observationes', *Novi Commentarii Academiae Scientiarum Petropolitanae* **13** (1769), London, Natural History Museum Library, public domain https://www.biodiversitylibrary.org/item/113647#page/638/mode/1up. (Online version in colour.)

reached the addressee, as he was to explain two years later.[17] Much more fruitful was Merck's exchange with Camper, to whom he first wrote in July 1782.[18] During the few years of their acquaintance, Camper patiently explained complex issues to Merck, provided him with

17 Merck's first letter to Banks remains unidentified; in June 1784 Merck recalled an unanswered letter sent two years earlier: Merck, *op. cit.* (note 1), no. 688; cf no. 691.

18 *Ibid.*, no. 531.

sketches and even introduced him to his method of drawing without perspective, which he considered adequate for scientific illustration.[19] Merck, in turn, regularly described and depicted for Camper specimens not only from his own but also other local collections. As early as 24 September 1782, for instance, Merck reported on the multitude of unexplored bones in the princely cabinet of natural history in Mannheim and offered to provide images of them, although this particular study trip exposed him to humiliation:

> I shook with rage that I was not allowed to draw [them], under the pretext that I was not an academician. I stole, however, some of these designs, and sent them to an unknown, very skilful draughtsman, who examined the pieces I indicated to him, and who drew the forms when he returned to his inn. You will see here copies of them, roughly sketched. If you are interested, you will have some good ones first.[20]

These bitter remarks interestingly contrast with the fervent opening of a letter to Sömmerring, written just a week later on 30 September 1782:

> I thank you on my knees for allowing me to draw your elephant skeleton. Today I wrote to Councillor Tischbein […] to hire the young painter Strack to do it for me. He will therefore contact you in a few days, and if he should not do so, as is entirely possible, then I ask you, for the sake of Holy Anatomy, to send the fellow to the task yourself. I have learned from my misfortune, so now I want everything to be drawn with a pen, for the ink and the brush make everything indefinite. So be strict about this […].[21]

Both letters may be regarded as a sort of diptych representing two faces of an amateur in the world of professionals in both the scientific and artistic domains. Merck, admittedly a neophyte in natural history, had some proficiency in drawing but he also realized that a professional artisan is indispensable to producing reliable scientific illustrations. He comprehended, too, that in scientific illustration accuracy has priority over aesthetics, which has prominent implications for the choice of the technique in drawing—and, by extension, printmaking.

The young painter mentioned in the letter to Sömmerring, Ludwig Philipp Strack (1761–1836), was a member of the widely ramified artist family, the Tischbeins, with whom Merck had long-standing relations. Strack devotedly drew the Kassel elephant, disregarding the terrifying cold, but his efforts ultimately do not seem to have resulted in engraved images.[22] The drawings after sketches Merck made on the sneak in Mannheim do not seem to have served as models for engravings either, and the *inconnu, très habile dessinateur* who was Merck's accomplice is an intriguing figure. The editors of Merck's correspondence identify him with Jean François Gout (1748–1812), taking into account his illustrations to Merck's *Knochenbriefe*.[23] While the proposed identification is plausible, Gout's contribution to the illustrations of the *Knochenbriefe* and, in more general terms, his role in Merck's scientific endeavours deserve a more thorough scrutiny.

Jean François Gout, the painter and printmaker of French origins, worked, among other places, in Darmstadt, where his presence was recorded in 1782.[24] Merck might not have

19 *Ibid.*, nos. 625, 683 and 669.
20 *Ibid.*, no. 548.
21 *Ibid.*, no. 549.
22 *Ibid.*, nos. 569 and 578.
23 *Ibid.*, no. 548, note 16.
24 Sven Hauschke, 'Gout, Jean François', in *Allgemeines Künstlerlexikon*, vol. 59 (De Gruyter, Berlin, 2008), p. 387.

heard about him until September 1782, when he reported to Camper on the 'unknown, very skilful draughtsman'. In October, however, Merck clearly had enough confidence in Gout's abilities, since he sent him to Speyer to draw the local ruins for Sophie von La Roche (1730–1807) and her husband, Georg Michael Franck von La Roche (1720–1788). On 4 November, the latter reported to Merck, among others, on Gout's accommodation in Speyer and mentioned the costs of his earlier stay in Mannheim.[25] This corroborates the conjecture that Gout was Merck's collaborator in September 1782. Nevertheless, no printed illustrations of any palaeontological specimens may be decisively attributed to Gout at that time, and he was by no means the only engraver in Merck's milieu.

Some unnamed artists mentioned in Merck's correspondence are difficult to identify, as is the case of the person he labelled as 'my draughtsman' (*mein Zeichner*), with whom he explored the Rhine volcanoes in spring 1783. Some scholars link this note to Johann Heinrich Schmidt, known as Fornaro (1757–1821), others to Gout, but with no convincing arguments, as Merck's account includes no details.[26] More promising is another letter, which moves us back to September 1782, when Merck sent 'some samples of the art of [his] young engraver' to Friedrich Justin Bertuch (1747–1822), the publisher and art connoisseur. Merck must have meant here Johann Leonhard Zentner (1761–1802),[27] whom he sent to Paris to gain proficiency in engraving and etching techniques under the supervision of Johann Georg Wille (1715–1808).[28]

Zentner is known for his landscapes—most notably etchings after Gout's aquarelles of the Speyer ruins—but had never hitherto been associated with scientific illustrations. Yet he is more than likely to have been commissioned for the first depiction of Merck's rhinoceros skull, considering a remark in the letter informing Goethe of the specimen in early July 1782: 'I have made a drawing of it, which is now being engraved in Paris.'[29] The most plausible candidate for the engraver implied is Zentner, who was in Paris at the time, and definitely not Gout, whom Merck might not have met until September. However, the engraving of the rhinoceros head produced in Paris remains unaccounted for. If Merck intended this image to be an illustration to accompany the first *Knochenbrief*, as proposed in the edition of his correspondence, this would be a rather unsuccessful overture to an ambitious piece. His subsequent actions involved a series of even more evident failures.

In the quoted letter to Sömmerring of 30 September 1782, Merck not only mentioned unspecified unfortunate experiences with drawing techniques, but also deplored the errors in the hastily prepared publication of the *Knochenbrief*. In particular, he had serious reservations vis-à-vis the draughtsman and the engraver who prepared one of the illustrations; nonetheless, he promised Sömmerring a revised version within 10 days.[30] In fact, this was another of Merck's over-optimistic assessments, as the multi-stage process of improvements took much more time and involved substantial edits, most notably a replacement of one of three quires of the text and one of two illustrations (which also

25 Merck, *op. cit.* (note 1), no. 566.

26 *Ibid.*, no. 598; Yvonne Schülke, 'Farbe & Ton. Ein Beitrag zur Farb- und Tongestaltung des deutschen Klassizismus am Beispiel von Johann Heinrich Schmidt gen. Fornaro (1757–1821). Mit einem Werkverzeichnis' (PhD thesis, Saarbrücken, 2016), p. 40, note 192.

27 Merck, *op. cit.* (note 1), no. 547.

28 *Ibid.*, no. 567.

29 *Ibid.*, no. 527.

30 *Ibid.*, no. 549.

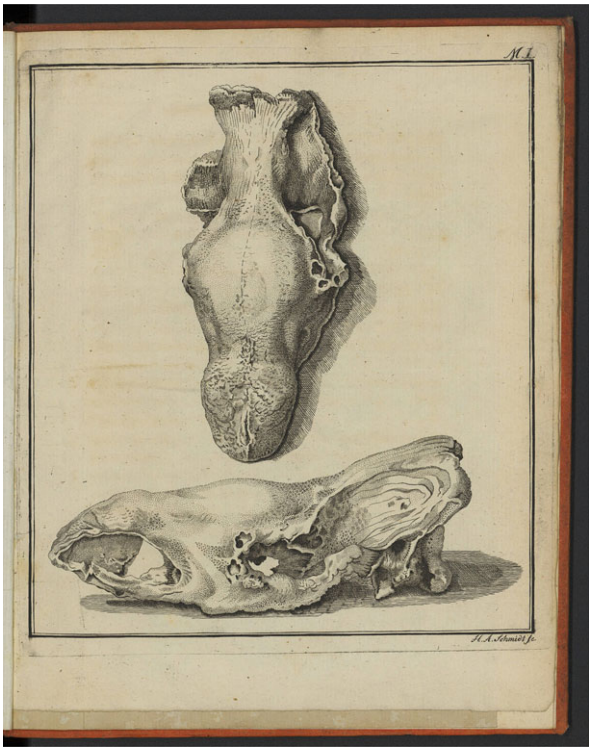

Figure 2. Heinrich August Schmidt (etcher), 'The rhinoceros skull from Johann Heinrich Merck's collection in Darmstadt', etching published as plate I in *Lettre à Monsieur de Cruse* […], Darmstadt 1782, Bibliothèques de l'Université de Strasbourg, H 138.111,1, public domain https://cdm21057.contentdm.oclc.org/digital/collection/coll11/id/62440. (Online version in colour.)

circulated independently).[31] As a consequence, specific copies of the publication, while sharing the same title page, are not identical.

An example of the original version is a copy from the collection of Johann Hermann (1738–1800), a Strasbourg naturalist and also a member of Merck's network.[32] This exemplar brings two further printmakers to the stage who specialized in cartography but also in scientific illustration: Heinrich August Schmidt (1733–before 1799) and Johann Christian Berndt (1748–1812), who signed plate I (figure 2—*H. A. Schmidt f*[*e*]*c*[*it*]) and plate II (figure 3—*Berndt fecit*), respectively. Merck's publication is neither the only nor the most prominent undertaking in which both Schmidt and Berndt participated, both contributing to the complex collective project of the *Grand Atlas D'Allemagne*, a set of 81 maps prepared between 1768 and 1789 and published by Johann Wilhelm Abraham Jäger (1718–1790).[33] With respect to the *Knochenbrief*, however, striking disparities in terms of accuracy, artistic quality and even the format of the illustrations are even more intriguing than the fact that Merck employed two artists to prepare barely two plates. Haste, Merck's

31 Merck, *op. cit.* (note 9), vol. 6, pp. 523–527.

32 Merck, *op. cit.* (note 1), *ad indicem.*

33 Walter Satzinger, '*Grand Atlas D'Allemagne* edited by Johann Wilhelm Jaeger, Frankfurt am Main, 1789', *Imago Mundi* **28**, 94–101 (1976) (https://doi.org/10.1080/03085697608592432).

principal advisor at that time, appears as the simplest and most plausible explanation, assuming that the engravers were working simultaneously.

It remains unclear how Merck encountered Heinrich August Schmidt, who prepared plates for various zoological works in the early 1780s. These included Johann Ephraim Goeze's (1731–1793) *Versuch einer Naturgeschichte der Eingeweidewürmer thierischer Körper* (Pape, Blankenburg, 1782) and Johann Samuel Schröter's (1735–1808) *Ueber den innern Bau der See- und einiger ausländischen Erd- und Flußschnecken* (Varrentrapp and Wenner, Frankfurt am Main, 1783). Schröter's choice is particularly significant as he had earlier had a very good experience with another engraver, Johann Stephan Capieux (1748–1813), and yet commissioned Schmidt to illustrate his work on snails.[34] All this does not explain, however, either the specific circumstances of Merck's commission or why his collaboration with Schmidt was limited to a single plate.

The circumstances that prompted Merck to hire Berndt may have come about in one of two ways. Merck could have approached this engraver himself, after he had seen 'a very beautiful petrographic chart' during a visit to the mineralogist Johann Karl Wilhelm Voigt (1752–1821) in Frankfurt in January 1782.[35] This mention plausibly refers to the petrographic map of the territory of the Princely Abbey of Fulda, bearing the signatures *gezeichnet von J. C. W. Voigt, 1782—gestochen von J. C. Berndt in Frankfurt am Maijn*.[36] One cannot rule out as a second route, however, that Sömmerring acted as an intermediary. Berndt engraved illustrations for Sömmerring, most notably for his *Über die körperliche Verschiedenheit des Mohren vom Europäer*, a dissertation he wrote in Kassel, where he also explained the outline of his theory to Merck in 1780.[37] The work, however, was first published, unillustrated, in Mainz only in 1784. The foreword to the second edition of 1785 (with '*des Mohren*' replaced by '*des Negers*' in the title) announces an addition of some 'quite correct drawings made by Mr. Range in Kassel', but the preserved copies are usually unillustrated.[38] A rare exception is Sömmerring's personal copy with four inserted engravings signed by Andreas Range (1762–1835) as designer and Berndt as engraver.[39] The plates themselves are undated; it is, therefore, impossible to state who hired Berndt first, Sömmerring or—which seems more plausible—Merck. Ultimately, however, both had grounds for complaint. In April 1785, the Frankfurt publisher Varrentrapp reckoned that 'everything in the engraving of the head of the Moor should be changed', which convinced Sömmerring that the plates did not deserve to be published at all.[40] Merck was aware of disadvantages in Berndt's

34 Günter Köhler, Ulrich Bössneck and Wolfgang Zimmermann, 'Johann Samuel Schröter (1735–1808) und die Anfänge der Faunistik in Thüringen', *Vernate* **32**, 5–46 (2013), at p. 37.

35 Merck, *op. cit.* (note 1), no. 499.

36 *Petrographische Landkarte des Hochstifts Fuld*, e.g.: Bern, UB Münstergasse, MUE Ryh 5010 : 10 (https://swisscollections.ch/Record/991005171469705501).

37 Merck, *op. cit.* (note 9), vol. 5, pp. 204–205.

38 Samuel Thomas Sömmerring, *Ueber die körperliche Verschiedenheit des Negers vom Europäer* (Varrentrapp and Wenner, Frankfurt am Main, 1785), p. xviii; Georg Lilienthal, 'Samuel Thomas Soemmerring und seine Vorstellung über Rassenunterschiede', in *Die Natur des Menschen. Probleme der Physischen Anthropologie und Rassenkunde (1750–1850)* (ed. Gunter Mann and Franz Dumont), pp. 31–56 (Fischer, Stuttgart, 1990), at pp. 53–56; Monika Firla and Uta Sadji, 'Zwei Darstellungen von Mohren im Nachlass von Samuel Thomas Sömmerring', *Études germano-africaines* **14**, 137–142 (1996), at p. 137.

39 Frankfurt am Main, Universitätsbibliothek Johann Christian Senckenberg, Nachlass Samuel Thomas von Soemmerring, Sign. Soe 2; http://sammlungen.uni-frankfurt.de/objekt/171/-ber-die-k-rperliche-verschiedenheit-des-negers-vom-europ-er/.

40 Merck, *op. cit.* (note 1), nos. 747, 794 and 796.

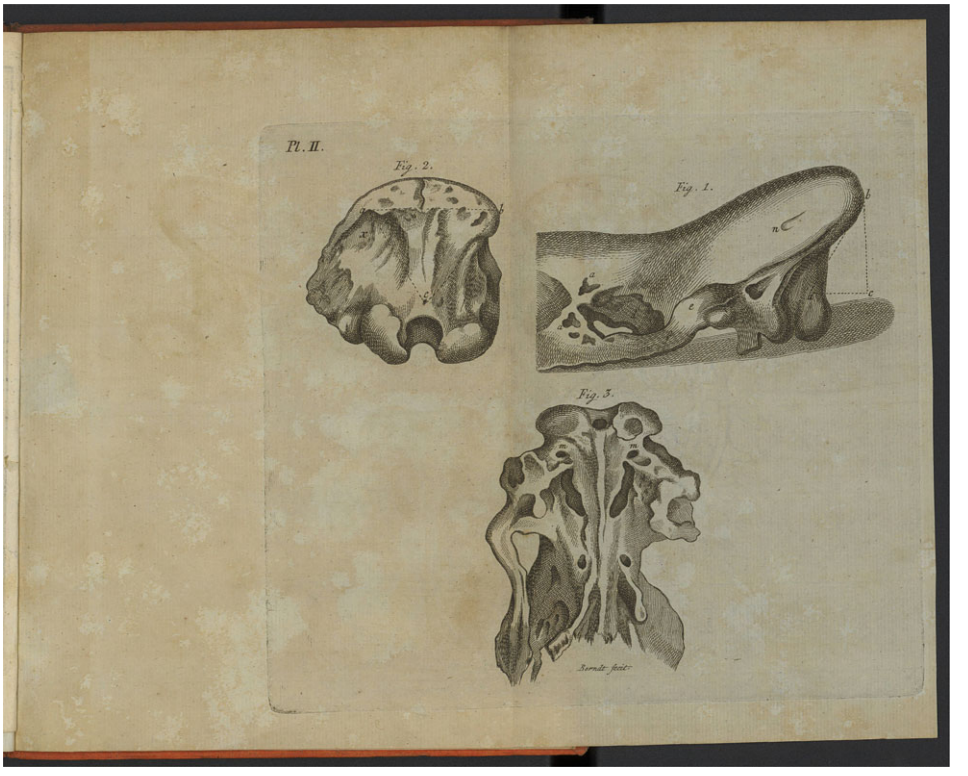

Figure 3. Johann Christian Berndt (engraver), 'The rhinoceros skull from Johann Heinrich Merck's collection in Darmstadt', engraving published as plate II in *Lettre à Monsieur de Cruse* […], Darmstadt 1782, Bibliothèques de l'Université de Strasbourg, H 138.111,1, public domain https://cdm21057.contentdm.oclc.org/digital/collection/coll11/id/62443. (Online version in colour.)

illustration for the *Knochenbrief* much earlier, even before the first copies were printed in September 1782, as he placed a caveat in the text that plate II was 'badly designed'.[41]

As mentioned, in early September 1782 Merck hoped to send an improved version to Sömmerring within several days. The new version of plate II, however, was ready neither in early nor late October.[42] Sömmerring was able to inspect an unspecified 'new drawing of the rhinoceros' in January 1783, and an even more ambiguous 'impression of the edited plate' in April, both mentions plausibly referring to plate II in the first *Knochenbrief*.[43] Meanwhile, Merck fixed the issues that needed attention in the text, as several copies demonstrate with the second quire replaced, but still with the two original engravings.[44] Ultimately, plate II was prepared anew using not engraving but the etching technique, but it was only in 1784 that this eventuated, as may be inferred from yet another group of

41 '[…] la figure de la Planche II, que je declare trés mal dessinée', Merck, *op. cit.* (note 9), vol. 6, p. 540.

42 Merck, *op. cit.* (note 1), nos. 553 and 561.

43 *Ibid.*, nos. 578 and 601.

44 For example, that in the Bibliothèque nationale de France, accessible online: https://gallica.bnf.fr/ark:/12148/bpt6k9750369x.

copies—invariably opening with the title page dated 1782, but including plate II signed *JFGout deli*[*neavit*] *et Sculp*[*si*]*t 1784* (figure 4).

This print appears to be Gout's first attested scientific illustration for Merck. Its design is undoubtedly much more elaborate and the etching of better quality than Berndt's engraving, but the format of the second version of plate II is even more divergent from that of plate I. Significantly, Gout's print is titled *Pl*[*anche*] *II de la I Lettre*, evidently to avoid confusion with plate II for the *Seconde lettre à Monsieur de Cruse,* […] *sur les os fossiles d'eléphans et de rhinocéros* […], or the second *Knochenbrief*, dated to 15 May 1784, which Gout must have therefore illustrated simultaneously.[45]

The giraffe skeleton, or a printmaker by necessity

As Merck continued his research on the bones of the rhinoceros and elephants, his Darmstadt collection systematically increased. Between 1784 and 1785, three skulls—of a crocodile, cetacean and tortoise—were of particular interest to their owner. The crocodile's head was discovered by the mayor of Altdorf in Bavaria as early as 1770. Goethe noticed the specimen and was about to buy it, but, to his misfortune, shared the news of the finding with Merck, and it was the latter who purchased the 'alligator head' in April 1783.[46] It remains unclear how and precisely when Merck acquired the cetacean skull, but it must have been in early or mid 1784.[47] The most enigmatic are the origins of the tortoise skull, recorded in written sources only from January 1785.[48]

Merck also pursued his investigations in various cabinets of natural history, often more successful in obtaining permissions to sketch the local specimens than in Mannheim in September 1782.[49] Along with expertise, he gained self-confidence, as epitomized by his most famous adventure, related to the illustration of the giraffe skeleton displayed in the museum of natural history in The Hague. Camper and the keeper of the collection, Arnout Vosmaer (1720–1799), constructed the skeleton in 1780 from the bones delivered from southern Africa by the Dutch explorer Robert Jacob Gordon (1743–1795).[50] During his first journey to the Low Countries in spring 1784, Merck examined the specimen and received not only Vosmaer's permission to draw it, but even a commission to prepare the respective copperplate. The condition was that Vosmaer would first publish the design, namely in the treatise on the giraffe conceived as part of his series on curious animals.[51] As has already been noted in the literature, Merck was to break this agreement.

45 Merck, *op. cit.* (note 9), vol. 7, pp. 96–112.

46 Merck, *op. cit.* (note 1), no. 562; Sven Sachs, Michela M. Johnson, Mark T. Young and Pascal Abel, 'The mystery of Mystriosaurus: Redescribing the poorly known Early Jurassic teleosauroid thalattosuchians Mystriosaurus laurillardi and Steneosaurus brevior', *Acta Palaeontol. Pol.* **64**, 565–579 (2019) (https://doi.org/10.4202/app.00557.2018).

47 Merck, *op. cit.* (note 1), no. 725.

48 *Ibid.*, no. 724.

49 *Ibid.*, no. 654.

50 L. C. Rookmaker, 'The observations of Robert Jacob Gordon (1743–1795) on giraffes (Giraffa camelopardalis) found in Namaqualand', *J. SWA Scientific Soc.* **36/37**, 71–90 (1981/82–1982/83); Graham Mitchell, 'The origins of the scientific study and classification of giraffes', *Trans. R. Soc. South Africa* **64**, 1–13 (2009); Mitchell, *How giraffes work* (Oxford University Press, New York, 2021), esp. pp. 41–48 and 342–348.

51 *Natuurkundige beschryving eener uitmuntende verzameling van zeldsaame gedierten* […], specific issues published with individual title pages between 1766 and 1805.

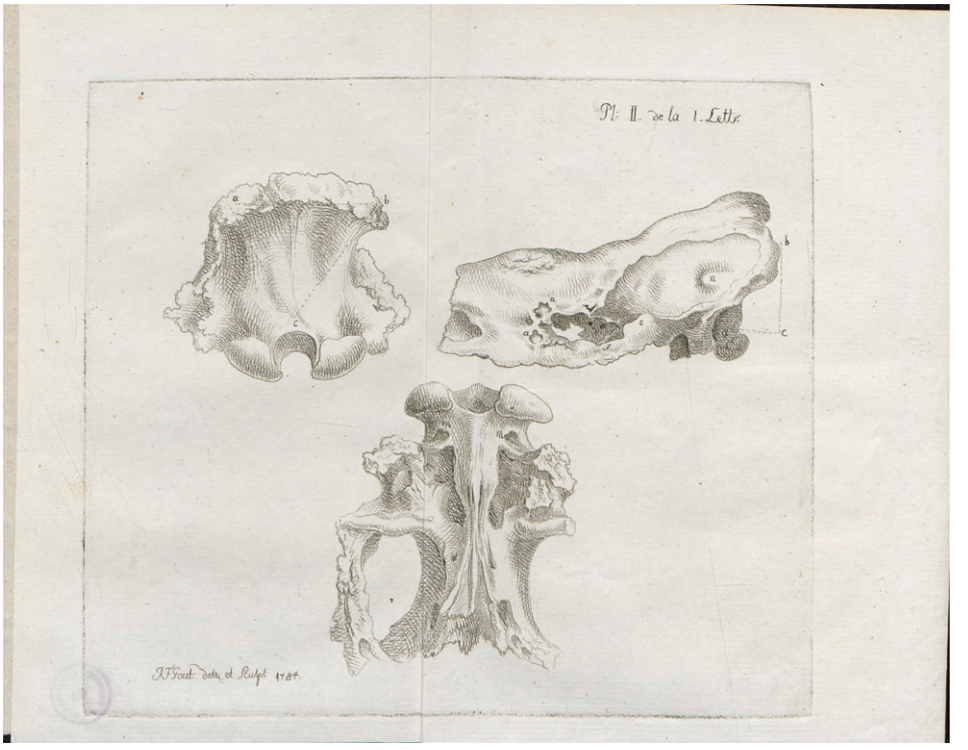

Figure 4. Jean François Gout (designer and etcher). 'The rhinoceros skull from Johann Heinrich Merck's collection in Darmstadt', etching, published as plate II in *Lettre à Monsieur de Cruse* […], Darmstadt 1782, Halle an der Saale, Universitäts- und Landesbibliothek Sachsen-Anhalt, 80 A 6317 (1) urn:nbn:de:gbv:3:1-647697, public domain https://digitale.bibliothek.uni-halle.de/vd18/content/pageview/10246707. (Online version in colour.)

Development of Merck's studies entailed constant exchange with Goethe, Sömmerring, Camper and others, and the correspondence was invariably enriched with images. The iconographic material examined hitherto, however, while including a substantial number of drawings, extends to only a few printed impressions. The two versions of the giraffe print, impressed from the plates of 280 × 177 mm and 535 × 322 mm, respectively, have received some attention from scholars, who have mostly elaborated on Merck's ambiguous role in disseminating the design.[52] Illustrations to Vosmaer's writing (figure 5) and an impression from Gordon's album in the Rijksmuseum in Amsterdam (inv. no: RP-T-1914-17-151; figure 6) have already been cited in the literature, as have the prints from Goethe's collection, now stored in the Goethe- und Schiller-Archiv in Weimar.[53] The latter archive also preserves an assortment of etchings representing the crocodile, tortoise and cetacean.[54]

52 Rookmaaker, *op. cit.* (note 50), pp. 84–88; Mitchell, 'The origins', *op. cit.* (note 50), p. 7; Mitchell, *How giraffes work*, *op. cit.* (note 50), p. 47; Merck, *op. cit.* (note 9), vol. 7, pp. 492–498.

53 Weimar, Klassik Stiftung, GSA 26/LXIII,9,5: https://ores.klassik-stiftung.de/ords/f?p=401:2:::::P2_ID:415942; Merck, *op. cit.* (note 1), fig. III.39 and fig. III.40; Merck, *op. cit.* (note 9), vol. 7, p. 141.

54 Weimar, Klassik Stiftung, GSA 26/LXIII,9,4: https://ores.klassik-stiftung.de/ords/f?p=401:2:::NO:RP:P2_ANSICHT,P2_ID:1,415941.

Figure 5. Johann Heinrich Merck (designer) and Jean François Gout (etcher), 'The giraffe skeleton from the Stadhouder collection in The Hague' (small version), design 1784, etching, final state published in Arnout Vosmaer, *Beschryving van het Kaapsche Kameel-paard* […] (Meyer & Warnars, Amsterdam, 1787), pl. XXIb, Universitaire Bibliotheken Leiden, shelfmark 1473 A2, public domain https://books.google.pl/books?id=jdguYi8NjKYC&printsec=frontcover&hl=pl&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false. (Online version in colour.)

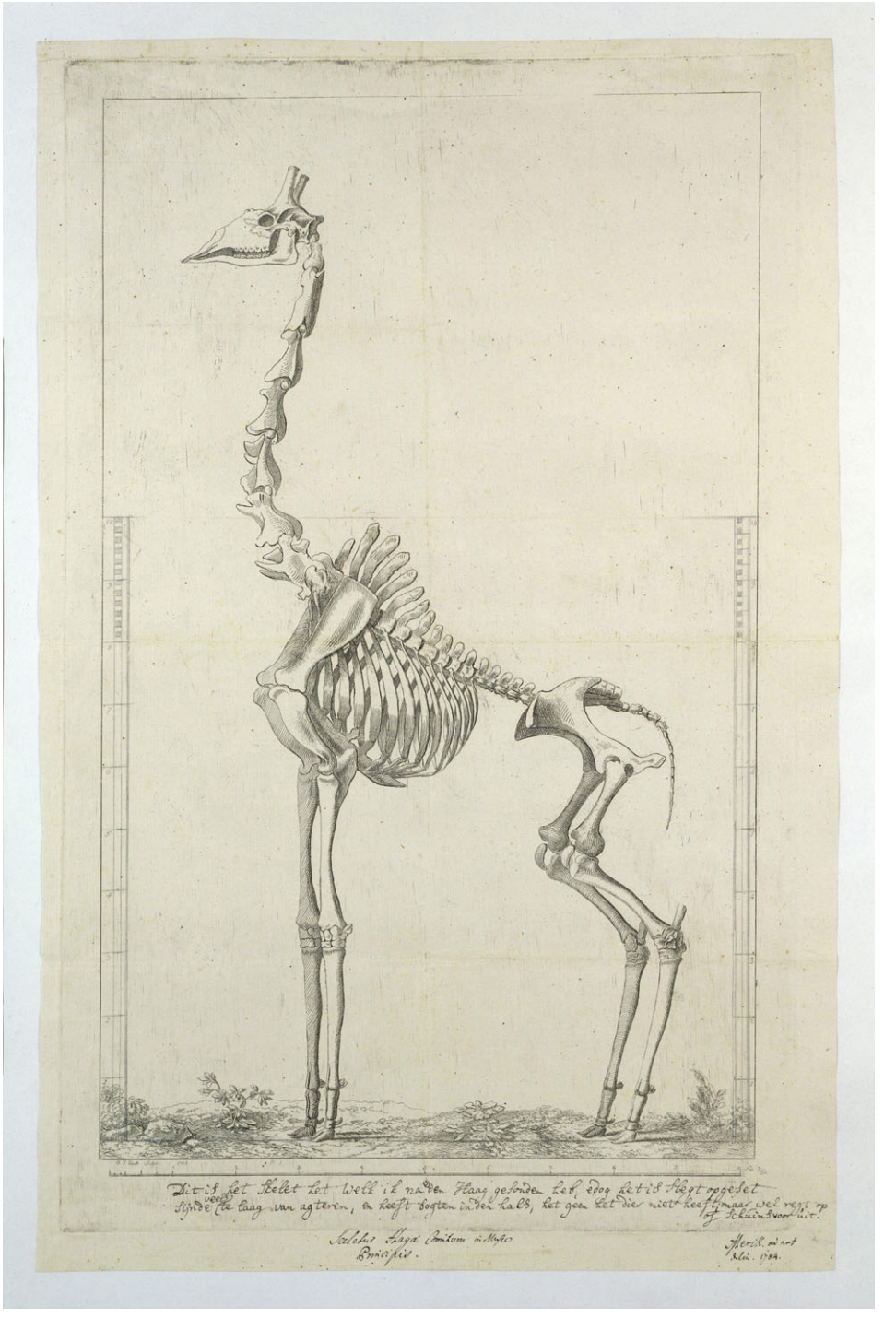

Figure 6. Johann Heinrich Merck (designer) and Jean François Gout (etcher), 'The giraffe skeleton from the Stadhouder collection in The Hague' (large version), etching, second state, July–August 1785, Amsterdam, Rijksmuseum, inv. no. RP-T-1914-17-151, public domain https://www.rijksmuseum.nl/nl/collectie/RP-T-1914-17-151. (Online version in colour.)

A similar set of impressions, which has hitherto escaped scholars' attention, is now housed in the British Museum (inv. nos. 1914,0520.615–618). Representing a giraffe skeleton (535 × 322 mm; figure 7) and the skulls of a gavial (318 × 215 mm; figure 8), tortoise (316 × 220 mm; figure 9) and cetacean (316 × 215 mm; figure 10), all prints stem from Joseph Banks's collection and bear Merck's signatures and his annotations, handwritten in pen in the lower margin. All impressions are dated to 1785 and signed by Gout. Notwithstanding that the etchings share the same date and etcher, as well as consecutive numbers in the British Museum collection, the impressions do not seem to have been conceived or perceived as one set, but—like those in Weimar—form two distinct groups. The giraffe print is substantially larger than the remaining three; it is also evidently the worse for wear, and has been folded and also trimmed. The impressions of the skulls, in contrast, are well preserved and include references, written in pencil in the upper right corner, to the respective pages of Jonas Dryander's (1748–1810) catalogue of Banks's library.[55] Thematically isolated and thus rather insignificant against the background of Banks's legacy, these etchings are noteworthy in the context of Merck's aspirations.[56]

Evidently not discouraged by the lack of response in 1782, Merck made another attempt to establish contact with Banks from The Hague in June 1784.[57] In the second letter, Merck shared his idea for writing a history of all the fossil bones in Germany, among which he distinguished the crocodile head from his collection. Merck announced an intention to illustrate his reasoning on this specimen with figures, which would prove wrong George Edwards's (1694–1773) understanding of a petrified head found in England.[58] In conclusion, Merck expressed a hope that the recipient might wish to communicate these findings to the 'Society of London'. This time, Banks honoured Merck with a prompt yet somewhat evasive answer.[59] Specifically, Banks dashed Merck's hopes that the Royal Society would speak out on his research, because an ancient resolution 'forbids them to give an opinion as a body on any subject'.

Upon his return from the Netherlands to Darmstadt, Merck continued investigations on specimens from his own collection, particularly the crocodile skull. Simultaneously, he was preoccupied with the likeness of the giraffe, based on a number of sketches he had made in The Hague. In fact, it seems that from the very beginning he had a hidden agenda and intended to prepare in parallel two copperplates: one for Vosmaer and the other, larger ('two-feet high') for the benefit of his own network of friends.[60] Vosmaer, who was not to discover Merck's disloyalty until much later, politely urged him on in December 1784, taking this opportunity to suggest some minor corrections to the original design.[61]

55 Jonas Dryander, *Catalogus Bibliothecae historico-naturalis Josephi Banks, vol. II: Zoologi* (Bulmer et soc., London, 1796), pp. 470, 472 and 479.

56 Neil Chambers, *Joseph Banks and the British Museum: the world of collecting, 1770–1830* (Pickering & Chatto, London, 2007); Edwin D. Rose, 'From the South Seas to Soho Square: Joseph Banks's library, collection and kingdom of natural history', in *Rethinking Joseph Banks* (ed. Simon Werrett), *Notes Rec. R. Soc.* **73**, 499–526 (2019).

57 Merck, *op. cit.* (note 1), no. 688; cf. no. 691; Neil Chambers (ed.), *The scientific correspondence of Sir Joseph Banks, 1765–1820*, 6 vols (Pickering & Chatto, London, 2007), no. 495.

58 Here Merck seems to confuse George Edwards, 'An account of lacerta (crocodilus) ventre marsupio donato, faucibus merganseris rostrum aemulantibus', *Phil. Trans. R. Soc. Lond.* **49**, 639–642 (1755) (https://doi.org/10.1098/rstl.1755.0096) with another report: William Chapman, 'An account on the fossile bones of an allegator, found on the sea-shore, near Whitby in Yorkshire', *Phil. Trans. R. Soc. Lond.* **50**, 688–691 (1757) (https://doi.org/10.1098/rstl.1757.0093); cf Merck, *op. cit.* (note 9), vol. 7, p. 166 note 3.

59 Merck, *op. cit.* (note 1), no. 691; Chambers, *op. cit.* (note 57), no. 500.

60 Merck, *op. cit.* (note 1), no. 699.

61 *Ibid.*, no. 716.

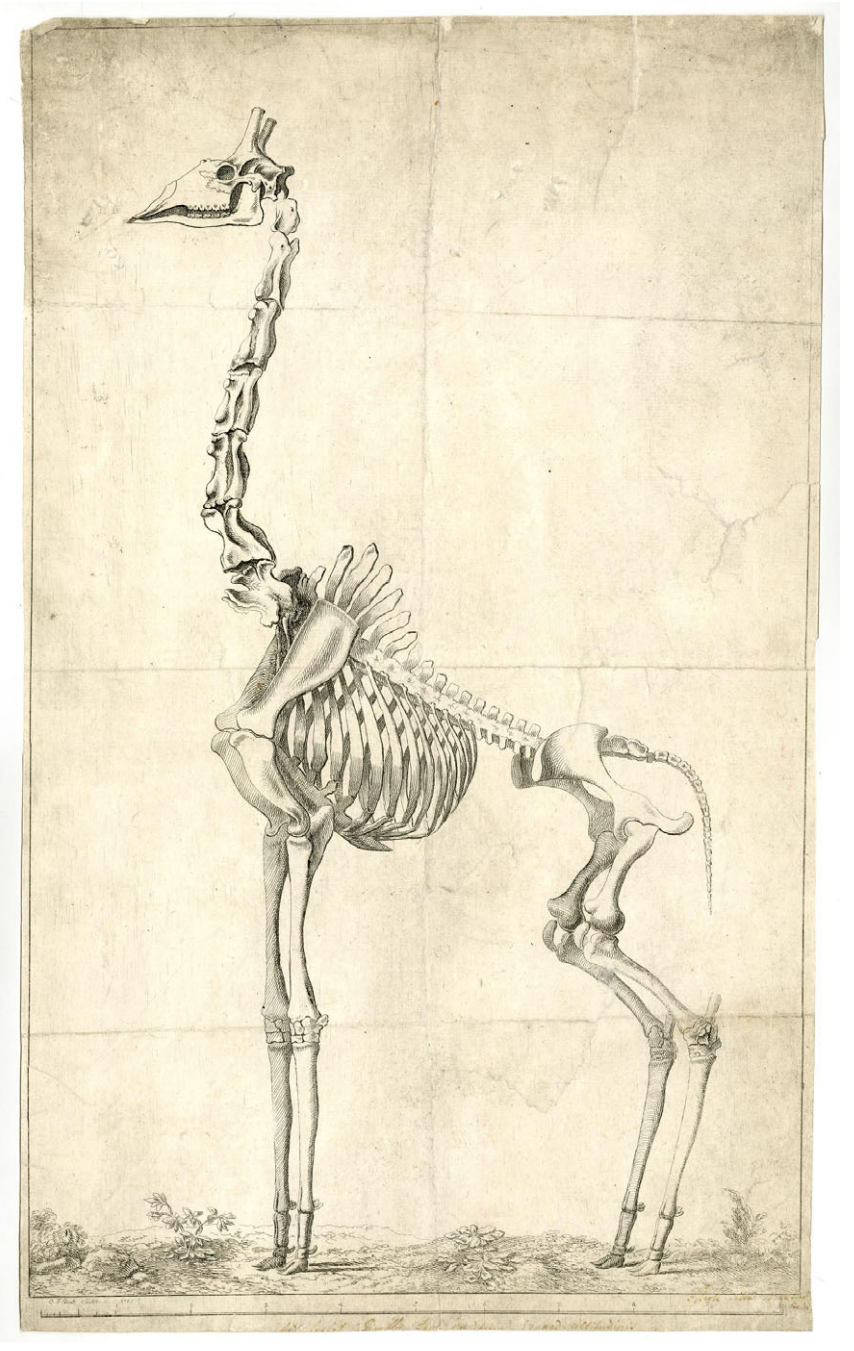

Figure 7. Johann Heinrich Merck (designer) and Jean François Gout (etcher), 'The giraffe skeleton from the Stadhouder collection in The Hague' (large version), etching, first state, January–April 1785, London, British Museum, inv. no. 1914,0520.615, © The Trustees of the British Museum https://www.britishmuseum.org/collection/object/P_1914-0520-615. (Online version in colour.)

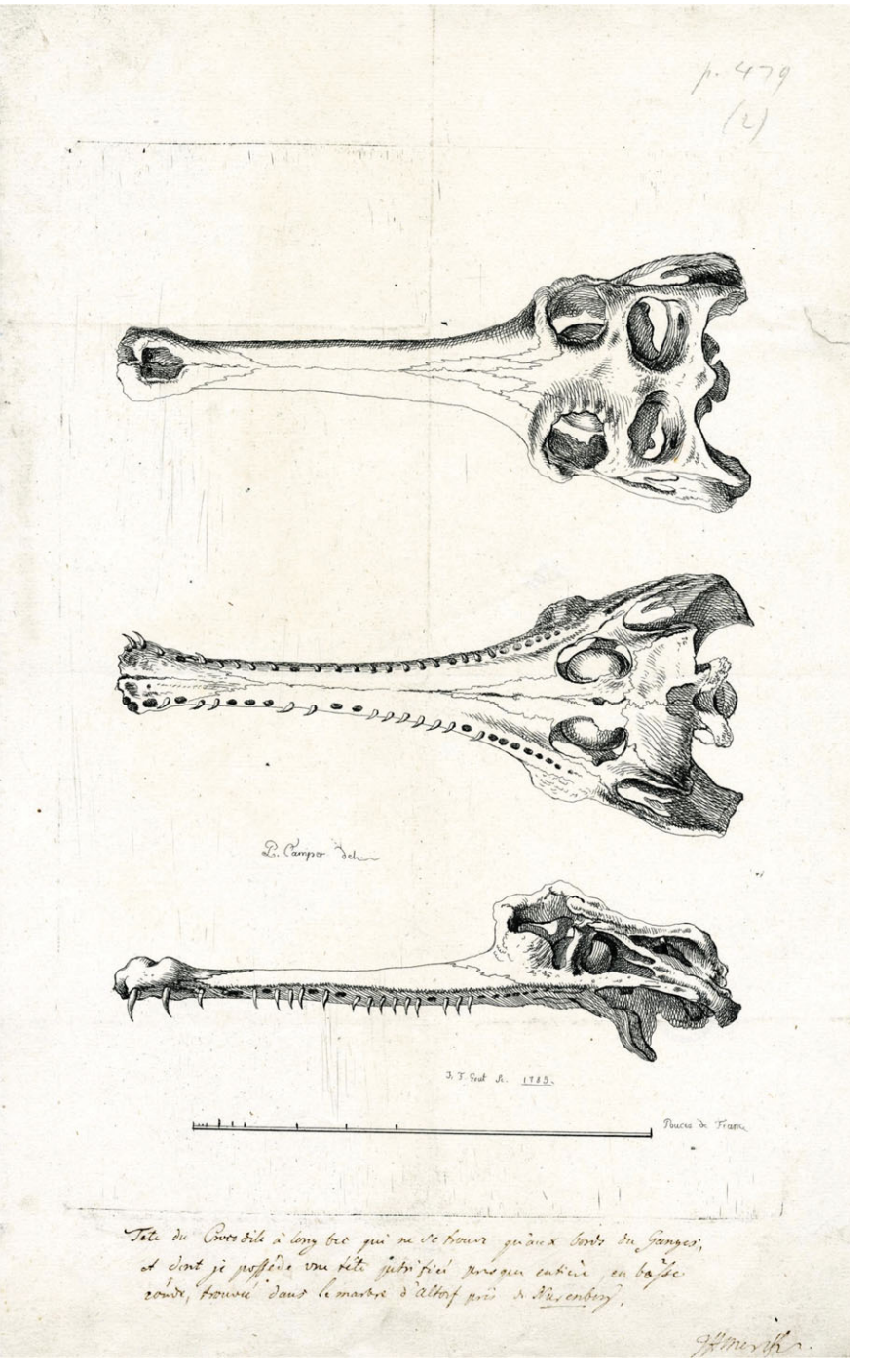

Figure 8. Petrus Camper (designer) and Jean François Gout (etcher), 'The gavial skull from Johann Heinrich Merck's collection in Darmstadt', etching, 1785, London, British Museum, inv. no. 1914,0520.618, © The Trustees of the British Museum https://www.britishmuseum.org/collection/object/P_1914-0520-618. (Online version in colour.)

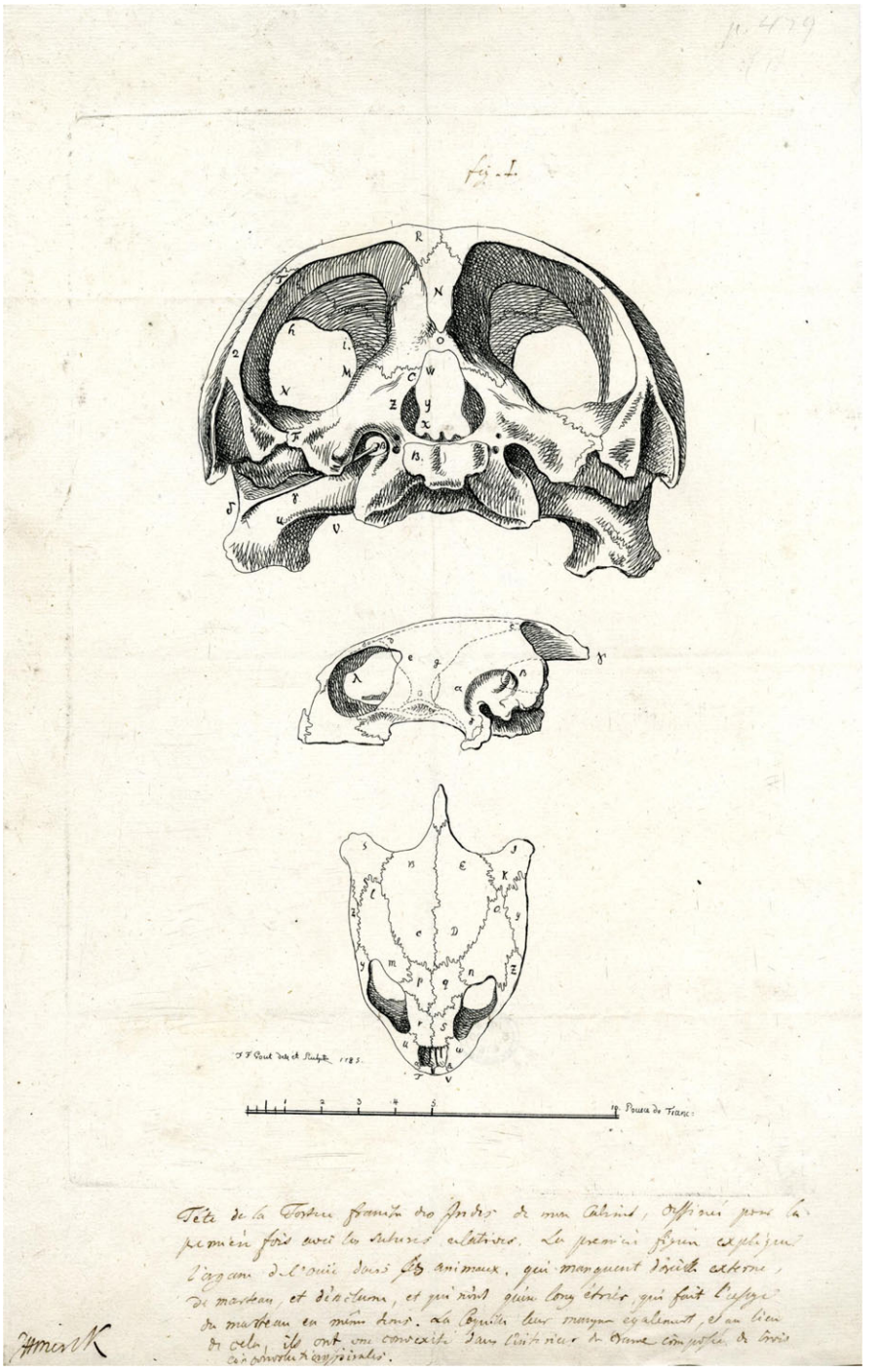

Figure 9. Jean François Gout (designer and etcher), 'The tortoise skull from Johann Heinrich Merck's collection in Darmstadt', etching, 1785, London, British Museum, inv. no. 1914,0520.616, © The Trustees of the British Museum https://www.britishmuseum.org/collection/object/P_1914-0520-616. (Online version in colour.)

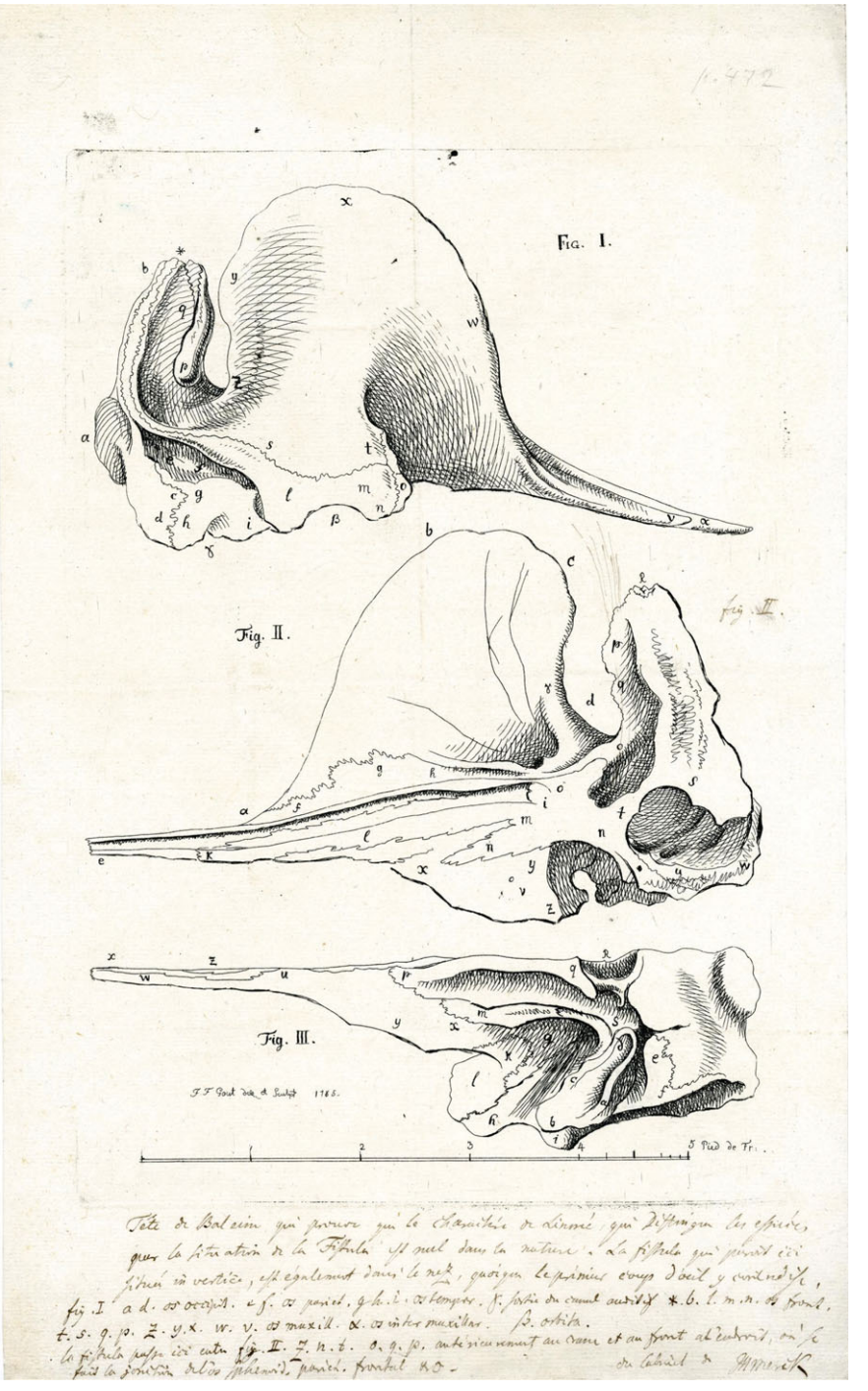

Figure 10. Jean François Gout (designer and etcher), 'The cetacean skull from Johann Heinrich Merck's collection in Darmstadt', etching, 1785, London, British Museum, inv. no. 1914,0520.617, © The Trustees of the British Museum https://www.britishmuseum.org/collection/object/P_1914-0520-617. (Online version in colour.)

The first version of the giraffe print, which Merck labelled as proofs (*ProbeBogen*), was ready in mid January 1785.[62] Before Merck discovered, in late January, a serious error in the animal's head section, he had already disseminated a few impressions.[63] One of these was intended for Goethe, who ultimately received two smaller prints, both preserved in Weimar.[64] Goethe also seems to have been among the first beholders of the larger print, finished in early April. Goethe commended the new version, and his opinion must have been based on the etching in large format now stored in Weimar.[65]

Also in early April 1785, Merck got back to Banks, whom he also sent a copy of the giraffe—plausibly one and the same as the etching in the British Museum (see figure 7). It was impressed from the same 'two-feet high' copperplate as the respective Weimar copy and provided with a similar handwritten note. In both impressions a caption in the lower margin explains that the print represents the 17-feet high giraffe skeleton from The Hague collection (in London the caption is only partly preserved due to the impression's trim); both copies also include Merck's signature as designer, placed in the lower right corner.

In his letter to Banks, Merck explicitly invited him to juxtapose this design with Jean-Nicolas-Sébastien Allamand's (1713–1787) 'horrible figure'.[66] Merck must have been confident about the outcome of this confrontation, as may be inferred from his earlier correspondence with Sömmerring.[67] Banks's reaction, however, was, again, rather disappointing. Acknowledging receipt of the print, he small-mindedly complained about the postal costs.[68] Only in concluding his response did he refer to the giraffe's height, as he recalled another letter he had recently received from Paris with information about 'a skin of a Giraffe … brought there lately from the Cape of Good hope in Good Preservation 16 feet 10 inc[hes] Paris measure in hight'. Nonetheless, Banks did not seem to be particularly interested in either the image or the represented specimen. He did not comment upon the quality of Merck's design vis-à-vis Allamand's at all. Likewise, he did not appear to remember that in October 1779 he had been informed about Gordon killing 'a Camelopardalis twenty two feet high'.[69]

Goethe and Banks were not the only ones to whom Merck dispatched the impressions of the giraffe before Vosmaer had the opportunity to inspect the design, not to mention to publish it. Significantly, Merck even explicitly asked one of the recipients, Johann Christian Daniel von Schreber (1739–1810), not to share the image because he had promised the plate to Vosmaer.[70] The latter received the commissioned copperplate only between 12 April and 21 June 1785.[71] Camper, who happened to have been on the spot when the parcel arrived, examined the design and reckoned that several improvements were necessary. Importantly, and contrarily to what the late date may suggest, it was the smaller plate Vosmaer received, which had been produced as early as January. Only later did he realize that Merck had not only widely disseminated the design, but also commissioned the

62 *Ibid.*, nos. 723–725.
63 *Ibid.*, no. 729.
64 *Ibid.*, no. 726, fig. III.39, cf. no. 730 and note 53.
65 *Ibid.*, no. 739, fig. III.40.
66 *Ibid.*, no. 737; Chambers, *op. cit.* (note 57), no. 572; cf. Rookmaaker, *op. cit.* (note 50), pp. 82–84.
67 Merck, *op. cit.* (note 1), nos. 724 and 729.
68 *Ibid.*, no. 751; Chamber, *op. cit.* (note 57), no. 577.
69 After: Rookmaaker, *op. cit.* (note 50), p. 76.
70 Merck, *op. cit.* (note 1), no. 743.
71 *Ibid.*, no. 760.

other, larger plate. Ultimately, Vosmaer used his small copperplate to produce impressions in some copies of his treatise, published only in 1787 with acerbic remarks on Merck's contribution (see figure 5).[72]

Meanwhile, Merck also modified the larger copperplate, as the Rijksmuseum impression demonstrates (see figure 6). It bears Merck's handwritten caption and his signature in the lower margin (*Sceletus Haga Comitum in Museo / Principis—Merck. ad nat.*[*uram*] *delin.*[*eavit*] *1784*), and also includes annotations handwritten by Gordon, who considered the skeleton to be 'badly assembled, much too low at the back and too bent in the neck'.[73] The giraffe's neck was indeed problematic for Merck, as may be inferred from his correspondence of January 1785. More revealingly of this, however, the Amsterdam impression, although produced from the same plate as the Weimar and London copies, differs from them precisely in sections of the animal's neck and back.

This is perfectly consistent with what Merck confessed to Casparson in the letter written in May 1786, quoted at the outset of this article. Merck recalls there that a year earlier he had found an error on the giraffe plate, scratched out some sections—including 'the neck, the Spina dorsi, the pelvis'—and etched them anew on his own. He made these improvements during his second trip to the Low Countries, when he was able to compare the design with the specimen in The Hague. Given the dates of this trip, the second state of the large giraffe copperplate, to which Gordon's comment refers, must be dated between July and August 1785.

An almost obvious next stop, after scratching out and etching anew isolated motifs of Gout's plate, was to become an independent etcher. Indeed, in late autumn Merck boasted to Sömmerring of his first, quite successful, attempts in this field, adding how much his 'eye learned about other artisans' works' thanks to this exercise.[74] Merck failed to mention the subject of his earliest work, so one may only wonder if it was in any way related to his etching for Philipp Engel Klipstein (1747–1808), an old friend as a collaborator of *Der Teutsche Merkur*, but also a specialist in mineralogy and mechanics. However, the unsigned and undated plate V to Klipstein's *Beschreibung einer neuen Dunst-Maschine* (figure 11) was only published in 1786.[75] Meanwhile, getting back to summer 1785, during his second visit to the Low Countries Merck made yet another—and last—attempt to win Joseph Banks's attention.

The crocodile, cetacean and tortoise skulls, or unsolicited gifts and broken trust

In a letter sent from The Hague on 15 July 1785, Merck apologized for sending Banks the giraffe by post and attached further gifts which he modestly announced as *quelches*

72 Arnout Vosmaer, *Beschryving van het Kaapsche Kameel-paard* […] (Meyer & Warnars, Amsterdam, 1787). In some copies the skeleton is reproduced in table XXIb, which bears Gout's signature (see figure 5); in other copies, however, the respective figure is numbered XXII; the design is almost identical, but the figure bears no signature (e.g. Universiteit van Amsterdam, Bibliotheek, shelfmark OG 63-2713 https://resolver.kb.nl/resolve?urn=dpo:10863:mpeg21:0283), see also Merck, *op. cit.* (note 9), vol. 7, pp. 494–498. NB Mitchell's account of the versions of the giraffe print ('The origins', *op. cit.* (note 50), p. 7; *How giraffes work*, *op. cit.* (note 50), p. 47) is inaccurate and misleading.

73 'Dit is het skelet het welk ik na [above added: s] den Haag gesonden heb, edog het is slegt opgeset / synde (added: veel) te laag van agteren, en heeft bogten in den hals, het geen het dier niet heeft; maar wel regt op / of schuins voor uit.' https://www.rijksmuseum.nl/nl/collectie/RP-T-1914-17-151.

74 Merck, *op. cit.* (note 1), no. 798.

75 *Schriften der Berlinischen Gesellschaft naturforschender Freunde* **7**, 386–391 (1786), pl. V; cf. Merck, *op. cit.* (note 1), no. 855.

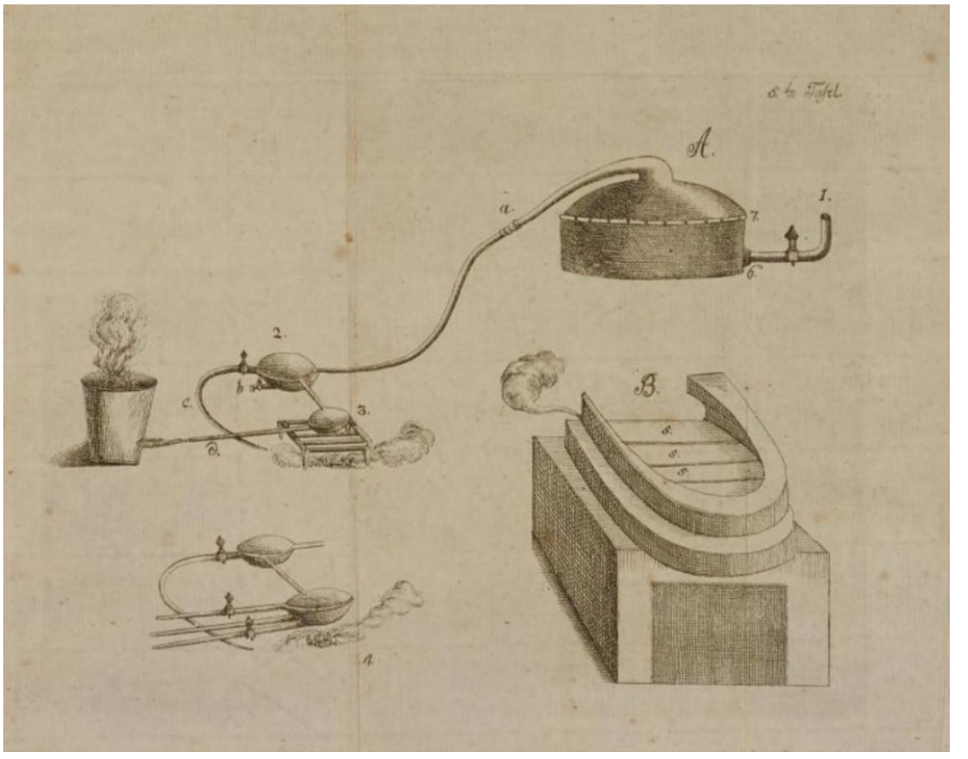

Figure 11. Johann Heinrich Merck (etcher), plate V to Philipp Engel Klipstein's 'Beschreibung einer neuen Dunst-Maschine', etching, undated, published in *Schriften der Berlinischen Gesellschaft naturforschender Freunde*, **7**, 1786, public domain https://books.google.pl/books?id=Y7eiqLQm0ywC&printsec=frontcover&hl=pl&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false. (Online version in colour.)

bagatelles.[76] These included Merck's article on the crocodile, recently published with an intention to correct George Edwards's misconceptions, and also some figures conceived to illustrate Merck's observations on 'less known animals', about to be published.[77] In contrast with what the editors of Merck's writings have tentatively suggested, the latter mention does not appear to announce the third *Knochenbrief* (published in 1786), but rather his treatises on the cetacean (also published in 1786) and tortoise (which never appeared in print).[78] The figures attached to the letter to Banks of July 1785 must, therefore, be identical with the three respective etchings preserved in the British Museum.[79]

The 'crocodile head' print (see figure 8) was impressed from the same plate as the analogous copy in Weimar. Both show three views of a gavial skull—from above, from below and in profile, with the scale given in the French 'inch' unit (*pouce de France*). The design is attributed to Camper and the etching to Gout, with the underlined date 1785

76 Merck, *op. cit.* (note 1), no. 770.
77 Merck, *op. cit.* (note 9), vol. 7, pp. 161–171; Dryander, *op. cit.* (note 55), p. 57 and 160.
78 Merck, *op. cit.* (note 1), no. 770, note 2; Merck, *op. cit.* (note 9), vol. 7, pp. 150–160 and 204–213.
79 Cf. Dryander, *op. cit.* (note 55), p. 479.

(*P. Camper del.*[*ineavit*]—*J. F. Gout sc.*[*ulpsit*] *1785*). The only difference between the Weimar and London copies consists of the fact that the latter also bears Merck's handwritten caption: 'The head of a long-snouted crocodile, which is found only on the banks of the Ganges, and of which I possess an almost complete, full fossilized head, found in marble at Altdorf near Nuremberg—JHMerck.'[80] Goethe certainly did not need such an explanation, as it was he who had drawn Merck's attention to this very specimen.

Likewise, the two remaining impressions in London—the tortoise and the cetacean skulls (see figures 9 and 10)—are almost identical to their counterparts in Weimar.[81] They are also similar in terms of size and concept to the crocodile print, showing the respective specimens in three views. The tortoise and whale prints also have the scale in French units, are dated to 1785 and are signed by Gout, who, however, is credited not only with the etching, but also the design (*J. F. Gout del.*[*ineavit*] *et Sculp.*[*si*]*t 1785*). Compared with the crocodile, however, the depictions of the tortoise and whale skulls are more elaborate, being additionally provided with small Latin and Greek letters, evidently conceived to refer to textual explanations printed (or intended to be printed) separately. In the print with the whale skull, each view is captioned on the plate as 'Fig. I.', 'Fig. II.' and 'Fig. III.' Analogous numbers may be found in the tortoise print, too, but only in the Weimar copy—yet another testimony to a constant process of improvement of the discussed prints.

The main differences, however, between the Weimar and London impressions lie again in the length of Merck's handwritten notes. Goethe's tortoise and whale prints only have short captions—*Testudo Indica* and *Balena Μυστικητος*, respectively[82]—whereas the impressions dispatched to Banks are provided with Merck's signature and elaborate explanations. In the case of the cetacean, these even refer to the particular details marked with letters. Finally, in sending these two prints to Banks, Merck seems to have presented them as a pair, as he inscribed the tortoise with ink as 'fig. I' and the whale as 'fig. II'.

Hence, the London prints representing crocodile, tortoise and cetacean skulls were plausibly attached to Merck's letter to Banks of 15 July. The crocodile may be regarded as a sort of annex to the copy of the respective article, which was published unillustrated, whereas the tortoise and whale appear as figures to the treatises at that stage only prepared for publication. Banks's answer is only known indirectly via Merck's letter to Camper of 5 September 1785.[83] Merck's correspondence with Camper was exceptionally lively in these weeks, preceding the latter's trip to England in October.

The letter Camper sent to Merck from London on 17 October 1785 commenced like many others in their more-than-three-year correspondence. He reported on various exhibits, which included remains of a mammoth and a petrified rib of a creature believed to have been a huge bird. Camper was more than sceptical regarding the latter identification, considering that the purported bird would have to be as large as St Paul's Cathedral. In the second paragraph, however, he unexpectedly shifted from the curious bones he encountered in the British collections to the pictures he saw on his visit to Joseph Banks:

> Of all the things I have seen, nothing has so surprised me, so struck me, as the present you made to Sir BANKS. Is it possible, sir, that I can find there a likeness of the crocodile's

80 'Tete du Crocodile à long bec qui ne se trouve qu'aux bords du Ganges, et dont je possede vne tête petrifiée presque entiere, en bosse ronde, trouvée dans le marbre à Altorf pres de Nurenberg JH Merck.'

81 Cf. Dryander, *op. cit.* (note 55), pp. 479 and 472.

82 Merck, *op. cit.* (note 9), vol. 7, p. 153 (tortoise) and p. 613 (cetacean).

83 Merck, *op. cit.* (note 1), no. 778.

> head, badly engraved, badly copied, of which I sent you the most beautiful drawing I have made in my life? With the simple inscription: P. Camper del. 1785! Should not I have been informed of it? Should not I have had a copy? As well as that knight? Whom you did not know, and who was surprised to receive these papers from a stranger? I saw there an engraving of the Giraffe in large size! Finally the head of the tortoise, on which you asked me for an explanation; the half-head of the cetacean etc. Is it possible, Sir, that you could have sent all this to a stranger without giving it to me, and without mentioning it to me? Is all this analogous to my way of treating you; is it in conformity with the frankness and cordiality, in which I would wish to be for life.[84]

There is no doubt that what so outraged Camper were the four prints currently stored in the British Museum, in particular 'the crocodile's head'. This was not the first time that Merck had copied or handed over Camper's illustrations without prior permission.[85] The question also arises of what exactly prompted such a vehement reaction: the inaccuracy of the illustration, the uncredited use of Camper's drawing, his concerns for his good name or, perhaps, simply jealousy of Merck courting Banks's attention?

Camper's reservations about the artistic quality of the print imply objections to the design's incorrectness, but his first explicit accusation touches on the infringement of copyright. This is, however, somewhat beside his point too, as the unauthorized use of his sketch seems secondary to the discrepancy between the exceptional calibre of the drawing and the deplorable quality of the print. This may explain, to some extent, why Camper declares himself dissatisfied by how his authorship was credited. To be precise, however, he does not complain about his name being associated with a poor image, but about the inscription being 'simple'—perhaps an allusion to the original drawing being Camper's gift and, as such, a piece for private rather than public consumption. Indeed, the most serious—and repeated—allegations focus on morals and commitments. In short, how could Merck give to Banks the fruit that grew from the seed that Camper sowed!

Merck immediately wrote an extensive apology, addressing the allegations point by point—with the caveat that it would be tedious. First, 'as regards this miserable head of a crocodile', Merck did not consider the print 'absolutely bad'. He confessed he had intended to show the plate to Camper, as he had shown it to his son, Adriaen, in Düsseldorf.[86] Unfortunately, the plate was in the luggage that remained in Düsseldorf due to complications with transport arrangements. Furthermore, the plate had only been finished a few days before Merck's departure, so he had no chance to make a single impression, as he thought he had already mentioned. Finally, back at home, he did not think about the plate until the spring, when he corrected it again and impressed six copies to share among his correspondents interested in the fossil from his collection. Second, as for the large giraffe plate, Merck had certainly had it packed and wished to show it to Camper during the last visit. Regrettably, in The Hague, where he hoped to make some minor corrections when comparing the design with the specimen, he found so many serious errors 'in the pelvis, in the lumbar vertebrae, so many confused things in the sternum, and in the cervical vertebrae that [Camper] would have laughed to tears to see all [Merck's] beautiful pretensions prostrated and trampled on'. Merck found it necessary, therefore, to keep quiet and to do better, if possible. As proof of his truthfulness, Merck

84 *Ibid.*, no. 791.
85 *Ibid.*, no. 710, cf. no. 670.
86 *Ibid.*, no. 681, note 5.

promised to send Camper both versions to amuse him 'with this beautiful fall of Icarus', once the corrected version had been finished.

Merck did not consider it necessary to go into detail about the cetacean and tortoise, but elaborated on the reproach of the clandestine sharing of things with 'strangers'. Yet Banks, Merck insisted, was by no means a stranger, since he had 'honourably' received both his letters and gifts. Merck admitted, however, he disseminated the giraffe print prematurely, which resulted from his misjudgement of its quality and accuracy, before he had realized the need for a serious revision. 'Fortunately for me,' he remarked both sarcastically and self-critically, 'there are only three copies in circulation.'

In the next paragraph, Merck moved from the prints to the manuscript of the treatise on the cetacean and tried to placate Camper with soaring tributes. He concluded that he had not deserved any reproach, but, notwithstanding, he felt the need for an additional personal confession:

> All my life, I have found myself living in this state of miserable secrecy, knowing it is for my own good to keep quiet. If you add to this the little value I place on everything I produce, the ridiculousness I am the first to find in it, the rapidity with which I move from one object to another, and that there is only the thirst to learn, which devours me, and which gives me pleasure, you will explain the rest of my conduct. Thinking again of the big cloud, sometimes very inconvenient, of His Serene Highness which made me close my mouth so often, and which always came between us two […].

Eventually, Merck offered to share with Camper some last observations on various specimens as additional compensation, adding pointedly 'before I feel like sending them to England'.[87] This conciliatory wink seems to mark the end of the intimate confession and a return to 'business as usual'—and this is how the letter continues.

In his lengthy exposé, Merck obviously concealed various details. For instance, he did not specify what happened with the remaining five (out of six mentioned) crocodile prints or where the other two (out of three 'in circulation') giraffe prints produced before the major revision were. A verification of these data is tempting, as it would be a way to assess the sincerity of the whole confession. This is not an easy task, however, as the sources are rather ambiguous. For instance, it is virtually impossible to tell which version of the giraffe Johann Hermann von Riedesel (1740–1785) received in May 1785.[88]

Apart from Banks and Goethe, a confirmed recipient of both giraffe and crocodile etchings was the Academy of St Petersburg. Merck attached these two impressions to a handwritten report on the fossil teeth of the rhinoceros, which he dispatched on 1 July 1785, just before he left for the Netherlands.[89] More complex is the case of the naturalist Casimir Christoph Schmiedel (1718–1792), whom Merck undoubtedly sent some images of not only the giraffe and crocodile, but also the cetacean and tortoise, yet both the date of dispatching the parcel and its precise contents are difficult to ascertain. Merck's letter is only known via Schmiedel's response of 11 February 1786.[90] Nonetheless, Schmiedel apologizes for a long silence and confirms that a 'bear's head' has arrived safely, which

87 *Ibid.*, no. 793.
88 *Ibid.*, no. 754.
89 Merck, *op. cit.* (note 9), vol. 7, pp. 494, 540 and 544.
90 Merck, *op. cit.* (note 1), no. 816.

may be identified as the bear remains he had wanted back in April 1785.[91] Thanking his correspondent for the images of giraffe, crocodile, cetacean and tortoise, however, Schmiedel confusingly labels them as 'drawings' (*Zeichnungen*). Merck is renowned for sending out drawings, but the assortment of items, recalling similar sets from Goethe's and Banks's collections, gives us reason to suspect that Schmiedel in fact received prints. It is also noteworthy that Schmiedel solemnly promises not to show these images to anyone without explicit permission. Merck must, therefore, have asked him for discretion, as he did with Schreber in April 1785.[92] Also in April 1785, Blumenbach expressed his gratitude for a small giraffe print, looking forward to the promised 'two-feet high' version.[93] Whether any follow-up on this obligation took place, however, remains vague—a recurring motif in Merck's correspondence and yet another token of his attitude to commitments.[94]

Thus, the sources do not bring a clear answer to the question of how many prints Merck had actually sent out by the summer of 1785. However, even if he under-reported the numbers in his apology to Camper, in order to play down his misconduct, these manipulations could not have amounted to significant quantities. That being the case, it is easy to imagine that Merck did not feel much guilt for having sent out merely a few prints, and only to interested specialists.

In subsequent weeks, Merck was quite busy—that, at least, is how he explained his long silence to Sömmerring on 5 December, in the same letter in which he shared news about his first etching.[95] Perhaps on this occasion Merck also realized that he had not heard from Camper since the memorable incident. Thus, on 6 December Merck wrote to Camper on the topic of various novelties, discreetly avoiding the sensitive issues, as if wanting to check whether their relations were back on track.[96] This time Camper did respond, but was evidently reluctant to let the matter drop too quickly. Before he continued their usual exchange of opinions on various specimens, he summarized his stance as follows:

> If I had no regard for you or your friendship, I would have overlooked what I saw, but I wanted to explain myself to you, in order to be able to forgive, or forget, if there was an offence. I am sorry that you found the engraving of the head of the crocodile beautiful; the drawing is not exact, and the engraving very weak, and vicious [*vicieuse*]. You did not tell me about it. I do not like the inscription *Camper del.* You should have added that it was my gift for you. The design was not necessary in London, where there are more of these crocodiles, among others a large one of 18 feet if I am not mistaken: a superb stuffed one, though neglected.
>
> As for the Giraffe, I have nothing to say, nor about the others, except that I believe I had a right to a copy, as Le Chevalier Banks. I thought I saw some mystery in it, and I wanted to warn you, to prevent the consequences, as I dare to confess to you that I am sensitive, perhaps too much so, about this item.[97]

Indeed, Camper might have forgiven, but did not forget—at least he still had not in September 1786, when he mentioned the contention to Sömmerring, taking this opportunity to share a

91 *Ibid.*, no. 741.
92 *Ibid.*, no. 743.
93 *Ibid.*, no. 748.
94 *Ibid.*, nos. 614 and 617.
95 *Ibid.*, no. 798.
96 *Ibid.*, no. 800.
97 *Ibid.*, no. 804.

rather merciless opinion on the accuracy of Merck's giraffe print and, overall, his expertise in osteology.[98] Merck, meanwhile, appeared increasingly confident in his abilities—if not in the realm of natural history, then in the field of scientific illustration. Both the quoted letters and the analysed impressions reveal a number of retouches and corrections, occasionally made by Merck on his own. Some edits were purely technical, such as the numbers added to the Weimar copy of the tortoise; more often, however, substantive modifications to the design were needed. While Merck admitted that some inaccuracies had appeared at the stage of preparing sketches, he also put down other deficiencies to the incompetence of the professional etchers, whom he eventually regarded as damage-doers, as encapsulated in the opinion quoted at the outset of this article.

The rhinoceros tooth, or lost illusions

Merck penned his opinion about the shortcomings of professional artists in May 1786, so at the same time as his third—and last—*Knochenbrief*, dated 1 May 1786, appeared in print. It is titled *Troisieme lettre sur les os fossiles d'eléphans et de rhinocéros* […] *addresseé à Monsieur Forster*. Levelling a criticism at his fellow etchers may not have been the first sign that his palaeontological ambitions were beginning to dwindle; this time, as if giving up hope of ever becoming a member of the Royal Society or the Academy in St Petersburg, Merck singled out Georg Forster, an old friend, then a professor in Vilnius. Addressing the writing to the scholar whom he had met in Kassel in autumn 1780, Merck must have recalled the beginnings of his preoccupation with palaeontology. Moreover, in the publication itself, apart from factual descriptions of various specimens, he found a place for more general insights on the development of natural history. Reflections on the people who were helping him in his research—including, among others, Camper, Sömmerring and Schmiedel—made him conclude:

> It appears from the care taken to provide me with the most important material in this genre, that my zeal in pursuing this research has not been ill received. There is only one class of Literati, deaf to their neighbours' calls for help, which is that of the compilers, always jealous of what one dares to undertake, without having asked their opinion in advance. However, if there were no such ploughmen who tore up the land, how would the cohort of usurers and peddlers, who sell the fruits of it, survive?
>
> There is another class of scholars, who, instead of advancing the progress of this branch of natural history, work only to retard it. It is a species of young men, who, equipped with a brazen forehead, dare to decide boldly on everything that is new in this field. Without proofs produced by exact figures, without detailed descriptions, without indication of the place & land, where each monument has been discovered in particular, they establish systems, forge the facts which are lacking, cripple those which they half know, & inundate the public with reports full of prodigies, so that the man of sense who comes after them has difficulty in making himself heard by exposing the supporting documents which he knows how to read, & decipher as he does.[99]

To some extent, this reads as a farewell, a feeling additionally strengthened, again, by the illustrations. Plates I and II etched by Gout—elaborate depictions of the upper and lower

98 Samuel Thomas Soemmerring, *Briefwechsel 1784–1792, Teil I: November 1784–Dezember 1786* (ed. Franz Dumont) (Fischer, Stuttgart, 1997), no. 392.

99 Merck, *op. cit.* (note 9), vol. 7, pp. 196–197.

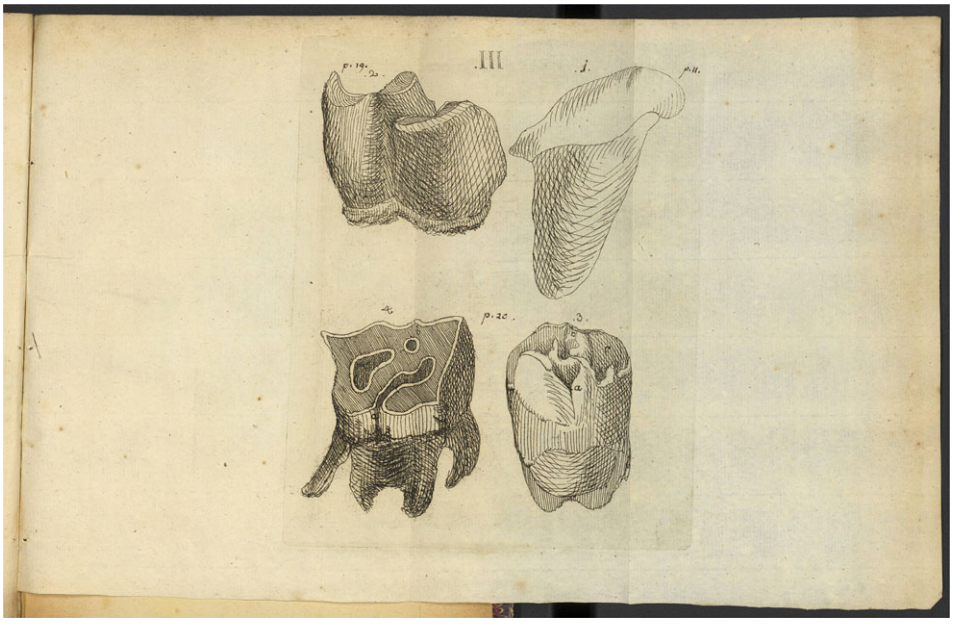

Figure 12. Jean François Gout (designer and etcher?), finished by Johann Heinrich Merck (etcher?), 'The teeth of rhinoceros of various species', plate III in *Troisieme lettre sur les os fossiles* […], Darmstadt 1786, Bibliothèques de l'Université de Strasbourg, H 138.112, public domain https://cdm21057.contentdm.oclc.org/digital/collection/coll11/id/62491. (Online version in colour.)

jaw bones, respectively, of the African rhinoceros—must have been prepared before the writing was ready for print, as the identical signatures *J. F. Gout del*[*ineavit*] *et Sculp*[*si*]*t 1785* demonstrate. Plate III, however, representing an assortment of rhinoceros teeth, bears no names or dates, which calls for an explanation. Both the circumstances of his break-up with Gout and the authorship of the plate remain unknown, but Merck appears a likely candidate for the creator or, at least, a co-creator who completed Plate III. Significantly, particular figures of Plate III are strikingly uneven in terms of completion. Most notably, figure no. 1, representing a rhinoceros incisor from the collection of Merck's and Forster's 'fellow friend' Sömmerring (figure 12)—perhaps after the latter's drawing sent to Merck in November 1785—seems barely sketched, as if abandoned unfinished.[100]

All this heralds the imminent end of Merck's passion for palaeontology. On 26 June 1786 Merck set off on a journey to Switzerland. Along the way, in Emmendingen near Freiburg, he visited a recently opened establishment consisting of a cotton-spinning mill and a weaving mill, as well as an orphanage providing them with labour, a year later described in *Journal von und für Deutschland*.[101] Perhaps it would be exaggerating to say that the founder of this ingenious institution, Samuel Vogel (1737–1816), played a similar role in Merck's life

100 Merck, *op. cit.* (note 1), no. 795.

101 *Ibid.*, no. 908; 'Zuverlässige Nachricht, von der, durch Herrn Hofrath Vogel in Emmendingen […] errichteten Spinn- und Weberey', *Journal von und für Deutschland* **4**, 553–555 (1787); Franz Josef Gemmert, 'Das Textilunternehmen Samuel Vogels in Emmendingen. Ein sozialpolitischer Versuch J. G. Schlossers', *Schau-ins-Land: Jahresheft des Breisgau-Geschichtsvereins Schauinsland* **80**, 105–115 (1962).

as the young Samuel Thomas Sömmerring in Kassel had done in autumn 1780. Nevertheless, just as then, Merck discovered a new object of fascination after his return to Darmstadt. He still maintained his old contacts, but devoted more and more time to new acquaintances. Some of them, like the Swiss silk manufacturer Jakob Sarasin (1742–1802), had broad horizons, so they could be appreciative readers of accounts of ancient fossils found along the Rhine.[102] Inexorably, if somewhat improbably, however, Merck turned from a fossil bone hunter to a cotton manufacturer. Ironically, only then did he finally become a member of foreign societies, although neither that of London nor St Petersburg, but the Societé des Sciences Physiques de Lausanne (autumn 1786) and the Bohemian Society of Sciences in Prague (early 1787). These accolades, however, did not revive his scientific passions, but instead coincided with the bankruptcy of his cotton-spinning mill and the development of his depression, which eventually led him to suicide on 27 June 1791.

Conclusion

As exceptional as it is, Merck's case may also be regarded as a synecdoche of wider phenomena typical of early modern scientific illustration. Advances in science correlated with the development of the graphic arts—to mention just one example, the invention of colour mezzotint in the late seventeenth century—which also involved the issues of intellectual property and artisanal competition.[103] However, even the most traditional graphic techniques, such as engraving and etching, known since the fifteenth century and still the most common in late eighteenth-century book illustration, came with various problems and repeatedly made printed images bones of contention in various ways.

First and foremost, access to empirical material was a prerequisite for creating at least preliminary sketches. Research could not be limited to studying specimens from one's own collection, yet many artefacts were hidden in remote places, often jealously guarded by their owners. Some naturalists made sketches *in situ* on their own, some were even able to provide the engraver with a proper drawn model, but transferring it to the copperplate and producing impressions were certainly matters for specialists. This opened up a whole spectrum of potential concerns, from the accuracy of the ultimate illustration to legal issues. The former was strictly embedded in the choice of technique, further qualified by the fact that various techniques afforded different possibilities for modifying the original design directly on the printing matrix if corrections proved necessary. The copyright issues dealt with the intellectual property and appropriate crediting of the contributions of all the relevant actors—the designer, draughtsman and engraver—a particularly delicate issue when the work of any of these produced unsatisfactory results and the plate needed modifications. Finally, dissemination often provoked issues, from the copying of designs and the duplicating of the original plates to the allowed number of impressions and the means of their distribution (e.g. only within the work they were meant to illustrate or also separately). Thus, a scientist depended not only upon keepers of the specimens to be represented, and draughtsmen and printmakers commissioned to produce the respective

102 Merck, *op. cit.* (note 1), no. 837.

103 Dániel Margócsy, *Commercal visions. science, trade and visual culture in the Dutch golden age* (University of Chicago Press, 2014), pp. 167–199.

images, but also publishers, who, in the worst-case scenario, might not be willing or able to publish illustrations at all.

All these issues are to some extent timeless. Among the factors, however, that distinguish the study of eighteenth-century scientific illustration is the avalanche of material available. While, on the one hand, discouraging hasty generalizations, it offers, on the other hand, unique opportunities for analytical studies. Comparisons among impressions from one copperplate sometimes prove them to be, on close inspection, only seemingly identical, which calls for an explanation. The visual material may be juxtaposed not only with its intended context—the respective scientific article or treatise—but also with the specimens themselves, if preserved, and, above all, an exceptional abundance of written sources, most importantly the correspondence. In some cases, as Merck's encounter with palaeontology demonstrates, bringing together visual and textual sources with an eye not only to their epistemological or aesthetic values but also their material aspects yields a unique insight into the processes of production, dissemination and reception.

Data accessibility

This article has no additional data.

Acknowledgements

This article is an unexpected result of investigation conducted in the collection of the British Museum as part of research project no. 2018/31/B/HS2/00533 funded by the National Science Centre, Poland. I would like to thank two anonymous reviewers of *Notes and Records* for their insightful feedback and constructive advice.