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DOING SCIENCE LIKE A PAINTER. AGOSTINO SCILLA AND THE “SURFACE” STUDY OF FOSSILS AND ANIMALS

Domenico Laurenza

The article examines the images produced by the Sicilian painter Agostino Scilla (1629-1700) for his treatise *The Vain Speculation Undeceived by Sense* (Naples, 1670), which set out to demonstrate precise similarities between fossils and marine animals in contrast with the theories that rejected the organic origin of the former. The article aims to show that Scilla, specifically as an artist, intends to limit himself to the study of the “surface” of fossils and animals. This distinguishes his work from contemporary scientists and other artist-scientists and represents an original position within the 17th century theoretical-artistic debate on the art-science relationship. New evidence is also presented regarding the genesis of the text and its wide circulation.

DOING SCIENCE LIKE A PAINTER.

AGOSTINO SCILLA AND THE “SURFACE” STUDY OF FOSSILS AND ANIMALS*

Domenico Laurenza

Agostino Scilla (1629-1700) was a painter from Messina, the author of sacred and profane scenes and of beautiful still lifes. In 1678, for political reasons, he left Messina and moved to Rome, where he spent the rest of his life¹. Apart from his artistic profession, Scilla had antiquarian and numismatic knowledge, and, at a certain point, developed an interest in the study of fossils, on which he wrote a treatise, the *Vain Speculation Undeceived by Sense* (*La Vana speculazione disingannata dal senso*, Naples [Messina?] 1670-1671), a text that had a remarkable impact on the history of palaeontology and geology. The text was printed in 1670, but was put into circulation in 1671, after the engravings were made in Rome, while the place of publication (Naples) by the printer Andrea Colicchia remains doubtful². In his book Scilla aims to demonstrate that the so-called figured stones, with their shell and fish forms, are the petrified remains of real animals that actually existed in the earth's distant past and not mere jokes of nature (*lusus naturae*).

Apart from being the focus of a long-standing and enduring interest on the part of palaeontologists³, Agostino Scilla's treatise has been the subject of a first wave of more specifically historical studies that, since the 1970s, started to focus on its genesis and historical significance⁴. But it is above all more recent studies that have

* I am deeply grateful to Paula Findlen for reading earlier drafts of this study.

1 L. Hyerace, ad vocem *Agostino Scilla*, in *Dizionario Biografico degli Italiani*, XCI, Rome 2018.

2 L. Hyerace, *Ancora su Agostino Scilla*, “Prospettiva”, 126-127, 2007, pp. 156-168, in part. 167, n. 34; G. Lipari, *Il falso editoriale a Messina nel Seicento*, Messina 2001; F. Giallombardo, *Agostino Scilla (1629-1700) e la cultura visuale della historia fra antiquaria e storia naturale*, Tesi di dottorato, Università degli Studi di Palermo, 2016, pp. 73-76; P. Findlen, *Projecting Nature: Agostino Scilla's Seventeenth-Century Fossil Drawings*, “Endeavour”, 42, 2018, pp. 104-106, note 16.

3 E.g. the recent I. Di Geronimo, *Agostino Scilla paleontologo. Fossili e Filosofie tra '600 e '700*, Messina 2014, or the series of studies on the minor or major “photographic” fidelity of the Scilla drawings compared to the fossil specimens preserved at the Sedgwick Museum in Cambridge, on which see F. Giallombardo, *La collezione Scilla presso il Sedgwick Museum of Earth Sciences. Pratiche di visualizzazione dal XVII al XXI secolo*, in *Immagini che fanno segno. Modi e pratiche di rappresentazione diagrammatica nelle informational images*, V. Manchia (ed.), “Carte Semiotiche. Rivista Internazionale di Semiotica e Teoria dell'Immagine”, Annali 2, dicembre 2014 [2015], pp. 86-103.

“Fossil” as well as “geology” or “palaeontology” and other terms are used here in their modern sense as a convenient shortcuts.

4 P. Rossi, *I segni del tempo. Storia della Terra e storia delle nazioni da Hooke a Vico* [1979], Milan 2003, pp. 44-45; N. Morello, *La nascita della paleontologia. Colonna, Stenone e Scilla*, Milan 1979; B. Accordi, *Agostino Scilla, painter from Messina (1629-1700), and his experimental studies on the true nature*

fully demonstrated the richness of the cultural connections, the visual complexity, the “philosophical” depth and importance of the representations in Scilla’s oeuvres within the context of the more general history of scientific illustration⁵. The work is available in a modern edition and an English translation⁶. Finally, there are few but excellent studies that focus on the part of Scilla’s artistic work which is most connected to *Vain Speculation*, that is his production of still lifes⁷.

Scilla wrote the *Vain Speculation* in Sicily in the form of a letter in reply to the missive of someone who is not directly mentioned (he is called «Signor Dottor N.N.» in the text)⁸. We now know that this was the Maltese physician and naturalist Giovanni Francesco Buonamico (1639-1680)⁹. The work, illustrated by a frontispiece and twenty-nine plates engraved by Pietro Santi Bartoli (1635-1700) from Scilla’s original drawings¹⁰, aims to demonstrate that marine animal fossils have an organic origin and

of fossils, “Geologica Romana”, 17, 1977, pp. 129-144; V. Martinelli, *Agostino Scilla pittore e scrittore messinese esule a Roma*, in *Scritti in onore di Salvatore Pugliatti*, Milan 1978, pp. 595-605; R. Wolff Purcell and S. Jay Gould, *Finders, keepers: Eight collectors*, New York 1992; S. Di Bella, *Le collezioni romane di Saverio Scilla*, “Archivio storico messinese”, 76, 1998, pp. 21-57; Id., *Agostino Scilla collezionista: la raccolta di fossili*, in *Wunderkammer siciliana: alle origini del museo perduto*, V. Abbate (ed.), Naples 2001, pp. 61-66; L. Hyerace, *Agostino Scilla collezionista: le raccolte di monete, medaglie, disegni e anticaglie*, in *ivi*, pp. 55-60.

5 V. Carpita, *Agostino Scilla (1629-1700) e Pietro Santi Bartoli (1635-1700): il metodo scientifico applicato allo studio dei fossili e la sua trasmissione ai siti e monumenti antichi*, “Rendiconti dell’Accademia Nazionale dei Lincei. Classe di scienze morali, storiche e filologiche”, ser. 9, XVII, 3, 2006, pp. 307-384; P. Findlen, *Agostino Scilla: A Baroque Painter in Pursuit of Science*, in *Science in the Age of Baroque*, O. Gal and R. Chen-Morris (eds.), “International Archives of the History of Ideas”, 208, 2013, pp. 119-159; Ead., *The Specimen and the Image: John Woodward, Agostino Scilla, and the Depiction of Fossils*, “Huntington Library Quarterly”, 78, 2015, pp. 217-261; Ead., *Projecting Nature*, *cit.* (see note 2); Giallombardo, *Agostino Scilla (1629-1700)*, *cit.* (see note 2).

6 *Agostino Scilla. La Vana Speculatione Disingannata Dal Senso*, M. Segala (ed.), P. Rossi (introduction by), Florence 1996 [«Biblioteca della Scienza Italiana»]; *Agostino Scilla, Vain Speculation Undeceived by Sense*, D. Pemberton and R. Williams (eds.), R. Palmer, R. Williams and I. Bernocchi (translation by), Cambridge 2016 (available online at:

<http://www.sedgwickmuseum.org/uploads/images/Collections/Woodwardian/Vain%20Speculation%20Undeceived%20by%20Sense%20-%20Agostino%20Scilla-V1.2.pdf>.

7 M. Marini, *Due nature morte di Agostino Scilla*, “Quaderni dell’Istituto di Storia dell’Arte Medievale e Moderna. Facoltà di Lettere e Filosofia dell’Università di Messina”, 14, 1990, pp. 49-52; M. Di Penta, *Agostino Scilla pittore di nature morte. Appunti per un catalogo*, “Paragone Arte”, XIX, ser. 3, 81 (703), settembre 2008, pp. 62-71.

8 Edition used: *La Vana Speculatione* [1996], *cit.* (see note 6), p. 35.

9 See Di Bella, *Agostino Scilla collezionista*, *cit.* (see note 4), p. 62 and note 9; Hyerace, *Agostino Scilla collezionista: le raccolte di monete*, *cit.* (see note 4), p. 55; Findlen, *Agostino Scilla: A Baroque Painter*, *cit.* (see note 2), pp. 121, 138-147.

10 The plates are numbered from I to XXVIII, with a double plate XI. On Bartoli as the author of the engravings see Carpita, *Agostino Scilla (1629-1700)*, *cit.* (see note 5) and Nicola Pio da Carpi, *Le vite di pittori, scultori et architetti* [1724], C. Enggass and R. Enggass (eds.), Città del Vaticano 1977, p. 128 («[...] La Vana Speculatione disingannata dal senso, libro in quarto, figurato con trenta rami di Pietro Santi Bartoli»). Two sets of drawings by Scilla are known: a set of pen drawings is in the Add. Ms. 19934 (London, British Museum: see also the *Appendix* in this article); another set is in the Sedgwick Museum library in Cambridge. According to Di Bella, because of some differences between the two set of drawings, the final engravings implied a third set of drawings. See Di Bella, *Agostino Scilla collezionista*, *cit.* (see note 4), p. 62 and note 14; Giallombardo, *Agostino Scilla (1629-1700)*, *cit.* (see note 2), p. 260.

that they are not, as claimed by the Maltese interlocutor in his letter, “jokes of nature” created directly in/by the stone. In particular, the Maltese fossils he had received from Buonamico and Scilla’s own Sicilian and Calabrian fossils were at the heart of this debate. Buonamico’s fossils and the letter had been delivered to the painter by the Sicilian scientist Paolo Boccone (1633-1704).

Scilla, as he repeatedly writes in his text, intends to put his art, his training as a painter, at the service of a scientific enterprise: to create images that without a shadow of a doubt highlight the precise morphological correspondence between fossils (or “figured stones”) and marine animals, thus demonstrating the origin of the former from the latter. The various theories that at the time rejected this origin considered what we call fossils to be stones whose form derived from animals, plants, humans, landscapes and so on, on account of astrological influences or because of a plastic virtue inherent in the stones or because nature had amused itself by imitating forms of the plant or animal kingdom in the mineral kingdom (*lusus naturae*). Figured stones also included forms with only a vague resemblance to natural forms, landscapes, clouds and so on¹¹.

Scilla’s artist’s eye and hand allowed him to highlight precise similarities in general form, detail and topography to fossils and marine animals. His intent was to prove a scientific theory (the organic origin of fossils) and reject another (the theory of figured stones).

This makes his enterprise special. It is not the simple use of illustrations or images commissioned by a scientist to catalogue nature or prove theories thereon, a practice that had become increasingly commonplace since the Renaissance. In his case, we are dealing with an artist who, in the first person, places his artistic skills at the basis of a scientific demonstration which, among other things, had a considerable impact on the development of earth sciences between the 17th and 18th centuries, at a crucial time for the birth of modern geology.

This therefore calls into question, in the most direct and stringent form, the relationship between art and science.

Scilla’s emphasis on empirical observation and representation of the natural record as opposed – as the title of the work states – to empty theory (*Vain speculation*) has been rightly connected with the new science of the Lincei and Galileo¹². In fact, Scilla came into direct contact with Galilean scientists who were active for various periods of time in Messina: the naturalists Pietro Castelli (1574-1662) and Paolo Boccone (1633-1704), the latter directly involved, as we have seen, in the production of *Vain Speculation*; the anatomist Marcello Malpighi (1628-1694), and the mathematician

11 M.J.S. Rudwick, *The meaning of fossils. Episodes in the History of Paleontology* [1972], Chicago 1985; P. Findlen, *Jokes of Nature and jokes of Knowledge: The Playfulness of Scientific Discourse in Early Modern Europe*, “Renaissance Quarterly”, 43, 2, 1990, pp. 292-331.

12 E.g. Carpita, *Agostino Scilla (1629-1700)*, cit. (see note 5).

and physiologist Giovanni Alfonso Borelli (1608-1679), the latter both authors of innovative studies of comparative and microscopic anatomy¹³. Recent studies have confirmed and deepened this important connection and have enriched our knowledge by highlighting the conceptual depth and visual complexity of Scilla's illustrations within the overall development of scientific illustration and in particular that relating to fossils. Moreover, they have also hypothesised possible connections with Leonardo's mid-seventeenth century revival which, with Rome as its epicentre in the person of Cassiano del Pozzo, led to the first printed edition of the *Treatise on Painting* (1651)¹⁴.

The study that follows confirms these general historical connections but aims above all to reveal the differences regarding the previous forms of relationship between art and science and the way this relationship evolved in the artistic theory and science of Scilla's time. One aspect differentiates and characterises Scilla's method and illustrations: his programmatic limitation to the *surface* configuration of the specimens under investigation. This is, in my opinion, the most historically relevant aspect of his work, because it reveals a whole series of connections, but also and perhaps above all, distinctions between art and science, in relation to the theoretical-artistic and scientific debate of his time and particularly in 17th century Rome, where Agostino spent many years working as an artist (1646-1651, 1662, 1678-1700).

Since this aspect of Scilla's work, that is its limitation to the surface of the objects studied, is apparently a more obvious and less creative feature of his work, it has received less attention till now, but in my view it is another fundamental aspect of his scientific work in connection with his training as an artist. Perhaps it is the most important and certainly a further and fundamental aspect of what Paula Findlen has defined Scilla's «philosophical understanding of what it means to see and to know»¹⁵.

But to understand all this in detail we must first enter the world of the plates created by Scilla for his treatise.

A comparative and visual method of the study of fossils

Even when Scilla uses an optical magnifying instrument (defined as «occhialino»¹⁶ or as «occhialetto»¹⁷, i.e., literally translated, «little eyeglass», although it is not clear

13 Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), pp. 130-147; Ead., *Projecting Nature*, cit. (see note 2), pp. 104, 122, 125; Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2).

14 Findlen, *Projecting Nature*, cit. (see note 2); Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2).

15 Findlen, *Projecting Nature*, cit. (see note 2), p. 117.

16 *La Vana Speculatione* [1996], cit. (see note 6), p. 88.

17 Ivi, p. 107.

whether it was a simple lens or a real microscope)¹⁸, he does not go beyond the surface morphology. The «occhialino» only serves to increase visibility and allow a more precise observation and graphic documentation of structures that are already visible to the naked eye and, unlike the great contemporary scientist Robert Hooke, who also studied fossils, it is not used to penetrate the fine structure of the fossil, otherwise invisible to the naked eye. The «very small teats» («mammelle»), i.e. the attachment structures of the spines on the surface of the «spatagi» sea-urchins fossils, which, in plate VIII, are represented as they appear magnified through the «occhialino» (figure III of plate VIII), are formations already directly visible to the naked eye, even in the case of small urchins (fig. 1). And indeed such structures appear in the urchin fossils that are represented, without the use of the «occhialino», in plates X and XI (fig. 2).

In short, Scilla seems intentionally and methodologically to limit himself to the “surface” of natural things. Scilla often anatomically dissects the fossils in order to understand their interior, but even in this case, he does so merely to observe and record the macroscopic appearance of these inner parts, at most improving their observation thanks to the *occhialino*¹⁹. No doubt the anatomical model played an important role in defining his methodology of analysing and representing fossils. But, unlike his anatomist friends who, even in terms of images, moved more and more towards a microscopic dimension, Scilla seems intentionally and methodologically to limit himself to the surface of natural things. As we shall see, he feels that this is a direct consequence of his being an artist. It implies setting himself a limit, certainly, but also claiming, compared to scientists, his own specific method of investigation of nature “as an artist”.

On the other hand, an aspect that Scilla developed thanks to his acquaintance with anatomist friends active in Messina is the comparative one. Both Borelli and Malpighi had developed studies of comparative anatomy between humans and animals. Scilla applied the comparative method to the study of fossils and animals and did so by methodologically using his visual skills as a painter.

Visual perception and representation tend to coincide in Scilla’s work, and the act of drawing is simultaneously both a careful and direct search and the observation of punctual identities or similarities between fossils and animals²⁰. From this point of view,

18 See M. Trinci, *L'occhio, l'occhialino e la vista di Agostino Scilla*, “Piccolo Hans”, 57, 1988, pp. 123-146, in part. p. 132 and Morello, *La nascita della paleontologia*, cit. (see note 4) p. 52, who considers it a magnifying glass: «I particolari morfologici degli animali fossili e viventi da lui messi in evidenza sono facilmente visibili con l'ausilio della sola lente (come io stessa ho potuto constatare)». Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), p. 151, considers it a microscope.

19 Another example, albeit not related to images is the case of the turbinates’ opercula which are broken so that their inner structure can be examined with this instrument: «Rotti molti opercoli, ho scorto, con l'aiuto dell'occhialino, varia sostanza abbracciata da' giri che sono di diversa»: *La Vana Speculatione* [1996], cit. (see note 6), p. 107.

20 On this valence of drawing see also the interesting remarks by Findlen, *Projecting Nature*, cit. (see note 2), p. 112.

Scilla's repeated use of the term *raffigurare* is significant. Although in modern Italian *raffigurare* means to represent something in an image, Scilla uses it with the meaning of «to compare fossils and animals» («e se talvolta non possiamo *raffigurare* alcune Glossopietre con denti naturali de' pesci»: «and if sometimes we cannot compare [*raffigurare*] some tongue-stones with the natural teeth of fishes»; my emphasis), after a term that in ancient Italian meant to recognise a person from the outline of his face²¹. On the one hand, Scilla seems to develop the old meaning of the term in the sense of «to compare». Indeed, after having described the action of «representing the fragments» («*raffigurare i frantumi*») of fossils «having their direct exemplary before one's eyes» («*avendone sotto gli occhi vivo l'esempio*»), that is to say, the action of observing and comparing the fossils and the corresponding animals, he introduces St. Augustine's maxim that all knowledge is based on the search for similarity and identity between things («*Similar enim similar noscitur: quia omnis notio rei notae est similitudo*»: «We identify things from other similar things; for all our notions of known things depend on similarity»)²². On the other hand, by always linking the comparisons to the images that represent them, he seems to move towards the modern sense of *raffigurare* with the meaning of “to represent”.

The most innovative aspect of Scilla's treatise is not, or not only, the exact representation of fossils. This had already been done previously and perhaps, from a strictly artistic and typographic point of view, in an even better way; for example, in the splendid plates in Benedetto Ceruti and Andrea Chiocco's *Musaeum Franc. Calcolari* (Verona, 1622)²³. As we shall see later, the use of images, even in the case of precise, realistic images, did not necessarily entail an advance in the scientific understanding of fossils. In the *Vain Speculation*, the truly novel and productive aspect of new scientific knowledge is the use of sophisticated images to realize and to record, in a systematic way, precise comparisons between fossils and animals.

The iconographic apparatus of the *Vain speculation* opens and closes with representations of animals and not fossils. The first plate represents shark teeth (fig. 3), while the last two represent the head and bodies of various types of sharks, with the teeth *in situ* (plate XXVII and XXVIII). These representations of animals are the terms of comparison for the corresponding figures of tongue-stones («*glossopetrae*») or fossil teeth represented in other plates in the book. The text introduces the reader to this web of comparisons, with constant references to the plates. Plate I as a whole

21 *La Vana Speculatione* [1996], cit. (see note 6), p. 74. See also, with the same or a different meaning, pp. 55, 81, 104.

22 *La Vana Speculatione* [1996], cit. (see note 6), p. 104; *Vain Speculation* [2016], cit. (see note 6), [156]. For the English translation of Scilla's text, where specified, the edition used is *Vain Speculation* [2016], cit. (see note 6). In other cases, translation by the author.

23 On these and earlier images see the classic work by Rudwick, *The meaning of fossils*, cit. (see note 11) and more recently Findlen, *Projecting Nature*, cit. (see note 2), pp. 107-117.

aims to counter the hypothesis of the wide variety of glossopetrae or tongue-stones as evidence of their being jokes of nature²⁴. On the contrary, in Scilla's opinion, their variety is a consequence of the wide variety in the animal's forms of teeth. As attested by plate I, shark teeth vary from species to species and, even within the same specimen at different ages and between the upper and lower jaw.

Likewise, figures II and III in plate III (fig. 5) and all the figures in plate XXII, which represent living specimens of two species of sea urchins (respectively *spatagi* and *istrice*), in complete and "anatomized" form (i.e. without spines or as isolated parts), are the animal terms of comparison for the representations of fossils of sea urchins contained in the successive relevant plates (plates VII-XI for *spatagi*, plates XXIII-XXVI for *istrice*)²⁵.

In four other plates the comparison is even more direct because the fossil specimen and the corresponding animals are included in the same plate. Plate II is a detailed comparison between the teeth in the jaws of various fishes (including sea bream and gilthead bream) and the fossil teeth of these fishes known at the time as snakes' eyes («occhi di serpi») ²⁶ and represented in the lower part of the plate. Plate VI (fig. 4) contains a double demonstration of fossil-animal morphological identity: at the bottom, a tongue-stone attached to other fossil fragments (figure III) is identified and compared with a shark tooth which has a similar curved profile (figure IIII). The top part offers the more complex demonstration that the indentation marked «A» in the fossil tooth represented in figure I and visible in other similar fossil teeth is due to the particular arrangement of leaning teeth in the animal represented in the upper left (figure II)²⁷. Likewise, in plate XVIII, the juxtaposition of fossil and extant animal vertebrae in the same plate is an integral part of the reconstruction of the missing parts in the fossil, both included in the same plate²⁸.

A fundamental tract in all these comparisons is the search for a perfect «correspondence» («corrispondenza», p. 101) between fossil and animal, which Scilla emphasises through various terms: «sameness» («istessità», p. 64), «exactly the same in the drawing» («istessissimi nel disegno» p. 51), «very precise» («puntualissimi», p. 67) comparisons, «most exact» («esattissima» p. 67) correspondence; animals and

24 *La Vana Speculatione* [1996], cit. (see note 6), p. 59.

25 See the relevant texts on pp. 77 and 99-101 in *La Vana Speculatione* [1996], cit. (see note 6).

26 Ivi, p. 63

27 Ivi, pp. 85-86.

28 At the bottom of plate XII the representation of the fossils known as «snakes of Malta» («Fig. II») and of three specimens of animals («Fig. III») allows Scilla to demonstrate that they were «not snakes but shells of some sea worms [...]». «I will show some of them through drawings», Scilla adds, addressing his Maltese interlocutor, «so that you may see that their species is the same and, from their correspondence you can understand the truth» («non serpi ma gusci d'alcuni vermini di mare [...] io n'essorrò alcuni in disegno accioch'ella vegga che la spezie è l'istessa e dalla loro corrispondenza possa comprendere la verità»: *La Vana Speculatione* [1996], cit. [see note 6], p. 89).

fossils «similar, namely exactly the same» («simili, anzi istessi a quelli» p. 103). As stated in the latter case, general similarity is not enough. Indeed, it was precisely this general and partial similarity which for centuries had nourished many of the theories denying the organic origin of fossils. These ranged from the neo-Platonic theories of sympathies and similarities between various kingdoms and parts of nature, to other theories, which Scilla particularly opposed, where fossils were declared as merely jokes of nature in stone, an effect of the stones' ability to "grow"²⁹. These supposed "figured stones" ranged from anthropomorphic representations (such as the famous human figure with a hermit's cap represented by Ulisse Aldrovandi in his treatise)³⁰ to the "figured stones" in the form of landscapes or medals or sculptures or, as in our case, of fish and other sea animals.

The search for the precise matching and the systematic exclusion of general similarity leads Scilla to distinguish three types of "fossils" (in the old sense of everything that is dug up from under the ground): 1) fossils with animal origin («forme perfette»: perfect forms of organic origin); 2) artifacts («perfect forms» of artistic origin, which had ended up in the ground, as in the case of an agate representing the Emperor Galba, previously considered as a figured stone or a joke of nature); 3) stones with «imperfect» configurations and only apparently figured³¹. The starting point for this distinction was the objection advanced by his Maltese interlocutor who, in order to support the existence of figured stones in the shape of seashells or fish teeth, had presented such examples as the «the black half moon so well drawn on the panther's right shoulder» («la mezza Luna negra sì ben disegnata su la spalla destra della pantera») or the musical notes visible on some shells. In the same context, Scilla adds, as a further object of controversy, the supposed «wonders in the gems or stones painted by nature in many galleries» («galanterie nelle gioie o pietre della Natura dipinte in molte Gallerie», p. 55), that is to say, the world of the Wunderkammern which, merely on the basis of generic similarities, displayed man's artistic works close to the supposed "artistic" works of nature, that is to say, the stones on which nature, in a kind of artistic joke, played at imitating or reproducing the forms of fishes, plants, people, and so on.

The configuration of the possibility of a nature which produced forms just for fun, with no useful purpose, had weakened the Aristotelian distinction between art and nature. This virtual convergence between nature and art with the application of the concept of "artifact" to nature had no little influence on the conception of the relationship between natural and artificial products in Bacon and Descartes, as has

29 «Io intendo della opinione di coloro [...] che vogliono che le pietre tutte [...] crescano»: *La Vana Speculatione* [1996], cit. (see note 6) p. 41 («I understand that the authorities cited in your very erudite letter think that all rocks, or at least all mineral ores, grow»: *Vain Speculation* [2016], cit. [see note 6], [19-20]).

30 U. Aldrovandi, *Musaeum Metallicum*, Bologna 1648.

31 *La Vana Speculatione* [1996], cit. (see note 6), pp. 55-56.

recently been pointed out³². At the same time, in the field of knowledge linked to the culture of the Wunderkammern, the weakening of a causal and teleological conception of natural forms developed the close observation of natural products especially in their “surface” aspect, that is, in their external morphological configuration, regardless of their inner “causes”. Consequently, since its polemical object was precisely the theories developed in this area, Scilla’s search for similarities between the figured stones and other products of nature regarded this “surface” level, which moreover fell within the limits of his doing science as an artist. Scilla, as we have seen, disputes the confusion between natural and artistic products and distinguishes between figured stones that are of animal origin and those that are artifacts or the work of man; nevertheless, he achieves this distinction by choosing to remain at the same “surface” level as the theories of figured stones and the Wunderkammern. Scilla, like the visitors to the Wunderkammern and the supporters of the theory of the figured stones, only studies the external appearance of fossils and animals, looking for similarities, although he does so in order to support opposite conclusions. This seems to be a fate shared by Scilla and other artists such as Leonardo (1452-1519) and Bernard Palissy (1510-1589) who were interested in fossils: initially attracted, as artists, by the supposed idea of a nature-artist, they ended up denying that very idea by demonstrating the animal origin of fossils.

In any case, the decision to reject the theories of figurative stones and of the Wunderkammern on their own level (the surface analogies) coincided with Scilla’s decision to do science as a painter, limiting himself to the external appearance of the natural world.

Images and study of fossils: a problematic relationship

Scilla was not the first to use images in order to study fossils or to compare fossils and organic forms. But the use of images and comparative representations in themselves did not immediately generate new theories about the origin of fossils.

In the *Historiae Animalium Liber III, qui est de Piscium & aquatiliu Animantium Natura* (Zurich, 1558) Konrad Gessner, opens the chapter on sharks with a complete representation of the animal (p. 207) and, after a few pages, inserts the image of a glossopetra or tongue-stone, namely, a fossil shark tooth (p. 210). However, even though the xylograph images fail to communicate the similarity between the fossil and the animal teeth discussed in the text, since they lack the details of copper engravings, in any case, Gessner seems to favour, whatever the

³² L. Daston, C. Park, *Le meraviglie del mondo: mostri, prodigi e fatti strani dal Medioevo all’illuminismo* [1998], Rome 2000, Chapter 7.

similarities, the interpretation of the shark's fossil teeth as fossilized snake's tongues (tongue-stones)³³.

Even as late as 1637, within the context of the Lyncean Academy, in order to prove a theory opposite to Scilla's, Francesco Stelluti used detailed engravings to propose, more or less directly, a comparative method (*Trattato del legno fossile minerale nuouamente scoperto*, Roma, 1637). The engravings were based on drawings made earlier on behalf of Federico Cesi (1585-1630), the founder of the Academy.

In one of the plates (plate 2) living trees showing their roots are represented together with fossil wood, but this is done in order to emphasise their morphological diversity and therefore reject the organic origin of fossil wood, the subject of Stelluti's treatise. Likewise, among the many drawings of fossil wood commissioned by Cesi, some of which are very similar to living woods, Stelluti seems to have selected the most 'difficult' ones for his treatise, that is to say, those whose inner rings show a wave pattern, as if they had been crushed, which is different from the normal rings of trees³⁴.

More striking is the comparison in images between a shark's head and a series of tongue-stones in two copper plates realized for Michele Mercati's treatise *Methalloteca Vaticana* in the second half of the 16th century (the treatise was published posthumously in 1714). Mercati intended to use the comparison to reject the theory of identity between tongue-stones and fish teeth. Paradoxically, these very same plates were to become famous, because in 1667 Nicolaus Steno (Niels Stensen, 1638-1686), the great Danish scientist active in Tuscany, included them in his treatise *Elementorum Myologiae Specimen [...] cui accedunt Canis Carchariae dissectum Caput [...]* (Florence, 1667), to prove instead that tongue-stones are just shark teeth; and they were used with the same purpose by Leibniz in *Protogaea* (plate VII), who took the idea from Steno, and also by Paolo Boccone in his *Recherches et Observations Naturelles* (Amsterdam, 1674)³⁵.

The general assumption that the illustrations played a key role in the progress of palaeontology³⁶ should be questioned, at least from the point of view of its

33 Gessner's concluding remarks are (p. 211): «quas aliqui lamiarum dentes vocant, quod mihi verosimile non sit: alij serpentium linguas, quod magis probo». On Gessner see Rudwick, *The meaning of fossils*, cit. (see note 11), pp. 1-48, and Findlen, *Projecting Nature*, cit. (see note 2), p. 107. See also S. Kusukawa, *The Sources of Gessner's Pictures for the Historia animalium*, "Annals of Science", 67, 2010, pp. 303-328.

34 Possible justifications of Stelluti's mistake have been proposed by D. Freedberg, *The eye of the Lynx: Galileo, his friends, and the beginnings of modern natural history*, Chicago 2002, pp. 343 and ff. and Carpita, *Agostino Scilla (1629-1700)*, cit. (see note 5). On Stelluti see also Findlen, *Projecting Nature*, cit. (see note 2), p. 114 and D. Laurenza, *Images and theories. The study of fossils in Leonardo, Scilla and Hooke*, in *Visual Representation in Early Modern Earth Sciences*, L. Ciancio and D. Laurenza (eds.), "Nuncius. Journal of the Material and Visual History of Science", 33/3, 2018, pp. 442-463.

35 Both Steno («Mercatus miniatensis, cuius mentionem supra feci [...]»: Morello, *La nascita della paleontologia*, cit. [see note 4], p. 138) and Giovanni Maria Lancisi, the editor of the posthumous edition of *Methalloteca*, were to note Mercati's mistake, even though they appreciated his illustrations. In particular, Lancisi (p. 334) also quotes Scilla among the authors who correctly interpreted the nature of fossils.

36 According to Rudwick, *The meaning of fossils*, cit. (see note 11), p. 9, the illustrations played a role in the progress of palaeontology, comparable to that of the microscope in biology. Rudwick's authoritative

chronological development, which only moves in the assumed direction in a slow, discontinuous, and ambiguous way.

At the beginning of the 17th century, Fabio Colonna (c. 1550-1631), who like Stelluti was another member of the Lyncean Academy, published a copper engraving in his treatise *Aquatilium, et Terrestrium aliquot Animalium, aliarumq. naturalium Rerum observationes* (Rome, 1606, reprinted in 1616), which presented a visual comparison, in the same plate, between a fossil specimen of a shell (*Buccinum lapideum*) and several shells of the same living animal. Colonna, unlike Stelluti, wanted to prove the identity between fossil and organic specimens, and then the organic origin of the former³⁷.

Just like Scilla, both Stenone and Colonna used etchings for a visual and comparative demonstration of the organic origin of fossils. But unlike Scilla, theirs is a unique case: no other comparative image appears in Steno's treatises, while in the case of Colonna, we find representations of other fossil shells in the same book and those of tongue-stones and other fossils in his *De glossopetris dissertatio*, but, in both cases, the images are not comparative, since they lack the representation of the corresponding animal. Of course, from this point of view, Fabio Colonna's work was a significant precedent for Scilla, who, apparently ignoring Steno, instead cites Colonna's work with admiration³⁸. But Colonna's quantitatively and qualitatively limited visual comparisons became the main and systematic form of demonstration in Scilla's case.

Indeed, both Steno and Colonna developed the demonstration of the animal origin of fossils through more causal and theoretical demonstration strategies. Although Steno started from a comparative study between the head of a shark he had dissected and the fossil glossopetrae or tongue-stones (a study including Mercati's plate), he then pursued a mainly mechanical, geometric, and corpuscular explanation of the process of fossilization and of the different forms of accretion of minerals and animal shells and simultaneously developed a general theory of the earth, which became famous for its stratigraphic aspects. The analysis is therefore developed towards a corpuscular and microscopic dimension (in the sense of invisible to the eye) or towards a cosmological dimension, which, in both cases, assign a secondary role to the comparative observation of fossils and animals in their surface aspects, even though this observation had been his starting point.

reconstruction remains valid, but with the clarifications here proposed. In general, for a problematization of the link between image-scientific truth see the classic studies by Martin Kemp (e.g. the essays collected in *Immagine e verità. Per una storia dei rapporti tra arte e scienza*, Milan 1999) and the more recent contribution by S. Kusakawa, *Picturing the Book of Nature: Image, Text, and Argument in Sixteenth-Century Human Anatomy and Medical Botany*, Chicago 2012.

37 The work is published at the end of *Fabii Columnae Lyncei Minus Cognitarum Rariorumque nostro coelo orientum stirpium ἔκφρασις* [...], better known as *Ekphrasis*, printed in Rome in 1606 and re-printed there in 1616. The plate is on p. LIII. On the editions of this work see Morello, *La nascita della paleontologia*, cit. (see note 4), pp. 65-67; on the plate see Rudwick, *The meaning of fossils*, cit. (see note 11), pp. 42-44.

38 Findlen, *Projecting Nature*, cit. (see note 2), p. 110.

Colonna's study devoted to the demonstration of the animal origin of tongue stones was developed in *De glossopetris dissertatio*. Its most important feature is perhaps a chemical one, which consists in experiments demonstrating the organic origin of the stony matter of shells which, unlike stones, are reduced to ashes if exposed to fire. Colonna explicitly presents this causal and experimental part as something that goes beyond the outward appearance and the relative comparisons between the external form of fossils and corresponding animal parts («Sed praeter aspectum [...]», «Regardless of their external aspect [...]»)³⁹. Scilla not only excludes the microscopic and “chemical” dimension, but also tends to minimize the search for causal processes of fossilization («I wish that we would not try to define Nature's ways of petrifying things, because she has thousands of ways of doing her work which we know nothing about»)⁴⁰, while the less convincing part of the work is the cosmological sections devoted to the theory of the earth, concentrated especially at the beginning of the book. The theory is developed in convoluted discourses and is devoid of any figures, and in his attempt to avoid bruising Catholic orthodoxy, he does not reject the role of the Deluge and only cautiously mentions the possibility of successive and minor floods⁴¹. The rigor of his comparative method prevents Scilla from considering “difficult fossils”, that is, fossils without a known corresponding living animal. What has been referred to as a limit and a weakness in his work⁴², namely, the mere consideration of the so-called “easy fossils”, in particular Cenozoic fossils from Malta, Sicily and Calabria, all with corresponding living animals, is actually a sign of seriousness and rigor, a direct consequence of his scientific method.

In the same period in England, Robert Hooke, just like Steno and Colonna, started to examine fossils going beyond their external appearance (*Micrographia*, London, 1665). He questioned, among other things, Stelluti's assumptions on fossil wood (p. 108), and included English “difficult fossils”, such as ammonites, in his study.

Although there are general analogies between Hooke and Scilla⁴³, my impression is that their strategy of study and representation was very different⁴⁴. Hooke had also had brief artistic training in his youth, was a skilled draughtsman and collaborated

39 *De Glossopetris dissertatio*, p. 31 (pp. 72-73 in Morello, *La nascita della paleontologia*, cit. [see note 4]). It is therefore necessary to problematize Rodney Palmer's interpretation, emphasizing Colonna's “observational approach”. See R. Palmer, *Making sense: Neapolitan illustrated books in the European republic of letters*, in «Napoli è tutto il mondo». *Neapolitan Art and Culture from Humanism to the Enlightenment*, L. Pestilli, I.D. Rowland, S. Schütze (eds.), Pisa-Rome 2007, pp. 243-269, in part. p. 249.

40 *Vain Speculation* [2016], cit. (see note 6), [52] («Desidererei non fossero determinate le maniere tenute dalla Natura nel petrificare le cose; perciocché la natura averà migliaia di strade da fare i fatti suoi, che noi non le sappiamo»: *La Vana Speculatione* [1996], cit. [see note 6], p. 57).

41 On other differences between Scilla and Steno see Findlen, *Projecting Nature*, cit. (see note 3), pp. 122-125.

42 Rudwick, *The meaning of fossils*, cit. (see note 11), p. 58.

43 Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 263-265.

44 See also Laurenza, *Images and theories*, cit. (see note 34).

with the great architect and astronomer Christopher Wren in the reconstruction of London after the Great Fire of 1666⁴⁵. And this, of course, played a part in his observational and representational skills as a scientist. But Hooke as a scientist, unlike Scilla, went deep into the microscopic, chemical, theoretical and systemic dimensions: all dimensions that Scilla considered far removed from his work as an artist-scientist and therefore tried to avoid. In Hooke's *Micrographia*, the visual and comparative analysis of fossils and wood, which also made use of the high quality graphic images he created, is dominated by the microscopic level (fig. 6), whereas the 'chemical' analysis of the substance (clay, marble) into which the living specimen was transformed prevails for both fossil wood and fossil shells (ammonites), and, as a consequence of this, also the reconstruction of the environmental cause behind this transformation (flood/water, volcanic cataclysm/fire, etc.).

In *Micrographia*, visual macroscopic or "surface" comparisons between fossils and living specimens are only found in the text and are non-existent at the iconographic level. The situation changes, at least in part, in the *Posthumous works* (London, 1705), in which we find five plates (plates I-V) based on Hooke's original drawings (recently made known by Sachiko Kusakawa)⁴⁶, plus two plates (VI-VII) based on drawings by Hooke's friend, Richard Waller (fig. 7). Waller edited the posthumous publication of Hooke's scattered notes and drawings.

Although the section dealing with fossils in the *Posthumous works* is a general theoretical and causal discourse (*Discourses of Earthquakes*) and although he also continues to use microscopic evidence, Hooke also includes macroscopic visual comparisons between ammonite fossils and shells. Plate I with fossils is in fact followed by plate II (fig. 7) with specimens of Nautili, the shells of living animals most similar to ammonite fossils that Hooke was able to find. Hooke is aware of the limitations of the proposed comparisons, the greatest being the enormous size of the fossil shells compared to those still living. Nevertheless, his interest in macroscopic comparisons is significant.

Equally significant is the general distinction introduced for "figured stones", between those «*exactly resembling* the Shape of things we commonly find (as the Chymists speak) in the Vegetable or Animal Kingdom» and those that «*bearing some kind of Similitudine*, and agreeing in many Circumstances, but yet not exactly figured like any other thing in nature; and yet of so curious shape that they easily raise both the Attention and Wonder [...]» (my emphasis)⁴⁷. Hooke actually seems to be moving

45 M.F. Walker, *The Limits of collaboration. Robert Hooke, Christopher Wren and the designing of the monument to the great fire of London*, "Notes and Records of the Royal Society of London", 65, 2, 20 June 2011, pp. 121-143.

46 Kusakawa, *Picturing the Book of Nature*, cit. (see note 36).

47 R. Hooke, *Discours of Eartquakes and Subterranean Eruptions*, in Id., *Posthumous Works*, London 1705, p. 280.

towards the study strategy promoted by Scilla. However, when he moves on to sea urchin fossils (*Helmet-stones*), for which he finds easier and more numerous analogies in the animal world, Hooke refers the reader not to a demonstrative representation of the comparison but to a direct examination or better to live comparisons between fossils and sea urchin specimens. Hooke contrasts this direct visual comparison between fossils and living specimens which are «dumb Witnesses» with their verbal descriptions⁴⁸. Unlike Scilla, his visual comparison does not involve images and representations and in plate III, devoted to *Helmet-stones*, all ten figures represent fossils (perhaps with one problematic exception)⁴⁹. However, despite these limitations, the strategy Hooke uses for studying fossils in the drawings and notes collected by Waller in *Posthumous works* is certainly closer to Scilla's method than the one used in *Micrographia*. The drawings and notes can be dated from 1668 onwards and thus certainly post-date *Micrographia*, while the more or less long time span in which they were made by Hooke remains unclear⁵⁰. If, in the current state of research, it is therefore difficult to assume that Scilla had any influence on this late development of Hooke's studies of fossils, the hypothesis seems more plausible for Waller's contribution to this section on fossils in Hooke's *Posthumous works*. In his commentary on Hooke's plates that only included fossils (plates IV and V), Waller adds notes comparing them with living specimens. And it is Waller above all who in plate VII adds very punctual images relating to the discovery of a detail of the internal structure of a fossil Nautilus corresponding to that of the living Nautilus represented in plate II (fig. 7). Waller's drawing, on which plate VII was based, dates back to 1687, at a time when Hooke's organic theory of fossils was under severe attack⁵¹. In the aforementioned contribution and, later, in his editing of Hooke's notes and drawings on fossils for the *Posthumous Works*, Waller does indeed seem to be moving towards a dimension of fossil study close to that of Scilla.

The visualisation of time: reconstructive images and “still lifes” of fossils

Despite their limitation to macroscopic comparisons, the images with which Scilla illustrates his treatise are not neutral, “photographic” representations of reality. «There is no neutral naturalism. The artist, no less than the writer, needs a vocabulary

48 Ivi, p. 285.

49 Kusakawa, *Picturing the Book of Nature*, cit. (see note 36), p. 130 and fig. 2, interprets figure 10 as a “contemporary echinoid”. However, Hooke's text is ambiguous: «The 8th and 9th figures represent the bottom and top of another sort of Helmet-stone, which seems to be filling up of a kind of Echini-shell, very like to those found in Devonshire and Cornwall, one of which I have delineated in the 10th figure: This last kind was of Chalk». The last sentence seems to refer to the specimen in Figure 10 as a fossil urchin. See Hooke, *Discours of Eartquakes*, cit. (see note 47), p. 285.

50 Kusakawa, *Picturing the Book of Nature*, cit. (see note 36), p. 132.

51 *Ibidem*.

before he can embark on a ‘copy’ of reality», wrote Ernst H. Gombrich in 1960, contributing to the development of the successful historiographic trend that highlights the intrusion of theoretical and rhetorical knowledge into apparently “realistic” images in naturalistic illustration⁵². Paula Findlen, in her most recent study on Scilla, has well highlighted the “conjectural” nature of some of Scilla’s plates and in particular the reconstruction through dotted lines of missing parts of a fossil and has also emphasised how Scilla applies a perspective and spatial complexity to fossils that was previously reserved only for anatomical or machine representations, a complexity that Floriana Giallombardo has compared to the anatomical plates of Leonardo and Vesalius⁵³. However, both scholars have also pointed out the strong difference between Scilla’s realistic demonstrations and Steno’s diagrammatic ones⁵⁴.

Steno’s explanation of fossils implied a theoretical level, relating to the history of the earth and its changes: things not directly visible that could only be evoked by visual diagrams, as the famous stratigraphic diagram made up of continuous and dotted lines that illustrate his treatise *De Solido Intra Solidum Naturaliter Contento Dissertationis Prodromus* (Florence, 1669). Descartes, who made extensive use of geo-cosmological diagrams such as those of Steno, writes: «Thus it often happens that in order to be more perfect as an image and to resemble an object better, an engraving ought not to resemble it»⁵⁵.

In my view, this is a fundamental turning point in the relationship between science and art, or at least of how Scilla understands them. Science was increasingly moving towards dimensions beyond direct vision: theoretical reconstructions, microscopic or telescopic visions. On the other hand, Scilla, as an artist, remained as faithful as possible to the directly visible, even in the case of the “conjectural” reconstruction of the original form of a given fossil.

As already mentioned, throughout the book Scilla constantly refers to plate I which opens the figurative apparatus of *Vain speculation* and which represents various images of animal teeth. It is a frequent term of comparison for fossil teeth.

It is likewise an integral part of the demonstration that an incomplete fossil jaw, with teeth of decreasing size (plate III, figure I; fig. 5) is actually a fragment of the shark’s teeth, shown in its complete form in Figure 7 of plate I⁵⁶ (fig. 3), whereas, for

52 E.H. Gombrich, *Art and Illusion. A study in the psychology of pictorial representation*, London 1960, p. 75 (*Arte e illusione. Studio sulla psicologia della rappresentazione pittorica*, Rome 2022, p. 93).

53 *Dioptrique*, Part IV. See Findlen, *Projecting Nature*, cit. (see note 2), pp. 117-131; Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 243-290.

54 Findlen, *Projecting Nature*, cit. (see note 2), p. 122; Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 265-266.

55 Findlen, *Projecting Nature*, cit. (see note 2), p. 122. On the use of diagrams in the theories of the earth from this period see K.V. Magruder, *Global Visions and the Establishment of Theories of the Earth*, “Centaurus”, 48, 2006, pp. 234-257.

56 *La Vana Speculatione* [1996], cit. (see note 6), p. 76.

the Maltese correspondent, this was evidence of a weakening of stone's «generative force» («forza generatrice»). On the basis of the animal specimen (plate I, figure 7; fig. 3), Scilla integrates the representation of the fossil with a reconstruction of the missing part (fig. 5). The comparative method becomes the basis for a palaeontological reconstruction. The missing part of the fossil is shown graphically by a dotted line (plate III, figure I).

Similarly, in plate XVIII, the observation-representation of a portion of a fish spine (figure V) allows the proper interpretation of the fossil remains of fish vertebrae (figures I-III) and a reconstruction of the missing parts in dotted lines⁵⁷.

This graphic reconstruction of incomplete fossil remains of animals will reappear in the most famous plate (pl. XII) of Leibniz's *Protogaea* (1691-1693; published in 1749), where it is used in relation to the reconstruction of the spine, in this case, of the alleged unicorn⁵⁸.

The evocation of forms that are not visible because they have been destroyed by time, in two plates in *Vain Speculation*, is certainly a dynamic and extremely interesting aspect of Scilla's drawings, because, like Steno's or Descartes' diagrams, it reconstructs the before and after of a temporal process.

However, Scilla reconstructs what is no longer visible as an “artist” would do, i.e. on the basis of animal forms directly visible to his eyes and not thanks to theories relating to the earth's distant past (Steno), supplemented, in the case of Robert Hooke, by the microscopic analysis of fossils.

With regard to the graphic reconstruction of missing parts, in addition to a possible connection with the scientist Giovanni Alfonso Borelli's use of dotted lines to represent the shape of Etna before and after the eruption of 1669 or subsequent animal body poses⁵⁹, there is also a possible connection with Scilla's antiquarian knowledge. Pietro Santi Bartoli, who engraved Scilla's drawings for the *Vain speculation*, played a role in the definition of this reconstructive method⁶⁰. Haskell and Penny have presented Bartoli as the turning point in the representation of ancient remains which faithfully reproduces their original state⁶¹. For example, in the representation of the painted

57 Typically, the text mentions first the representations of fossil vertebrae: «Maggior chiarezza ci darammo le vertebre [...] Eccole (a) [(a) refers to plate XVIII Fig. I, II, III, IV]. S'osservi ch'elle mostrano il luogo donde si disgiunsero le spine laterali». Then Scilla offers a comparison with the animal: «egli è vero, ma non si ferma qui la mia osservazione. Dobbiamo prima ricordarci del disegno della spina tutta d'un qualche pesce [...]»: *La Vana Speculatione* [1996], cit. (see note 6), p. 94.

58 On the problematic origin of this plate, see *Gottfried Wilhelm Leibniz. Protogaea*, C. Cohen and A. Wakefield (eds.), Chicago 2008, pp. 103 and XXXIX-XL.

59 *Historia et meteorologia incendii Aetnaei anni 1669*, Reggio Calabria 1670, and *De motu animalium*, Rome 1680. See Findlen, *Projecting Nature*, cit. (see note 2), p. 125.

60 On the link between reconstructive methods in early palaeontology and antiquarian practices, see also Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), p. 150.

61 F. Haskell, N. Penny, *L'antico nella storia del gusto: la seduzione della scultura classica, 1500-1900*, Turin 1984, p. 28.

vault of an ancient tomb (fig. 8), Bartoli does not reconstruct the missing scenes, but, based on the comparison with the undamaged parts, only suggests the shape of the original frames, with lines covered by the hatching indicating the damaged part⁶². This reconstruction which is minimal, certain – as it is based on a comparison with the undamaged parts – and graphically expressed is very similar to Scilla's.

The visualisation of time also emerges in another aspect of Scilla's plates: the representations of fossiliferous blocks of rock (figs. 4, 9). Previous authors from Gessner to Aldrovandi had already used this type of representation, but, in their case, the sense was to highlight the particular texture, with “decorations” in the form of shells or otherwise, of this or that rock. It was like representing the various veins of a piece of marble, which in fact Aldrovandi, in one case, depicts as a compact slab of marble seen from above and below⁶³.

The representation of fossiliferous blocks of rock in Scilla's case becomes an integral part of his demonstration of their organic origin (figs. 4, 9). What he emphasises in his images are not “decorations” of a rock in the shape of shells or fish, but petrified scenes of ancient marine life trapped in the rock. The “disorder” with which the fossils are presented is one of the pieces of evidence he presents against the hypothesis that they were forms that grew inside the rock. For example, in the case of a cluster of tongue-stones (fig. 9), the roots of these shark's teeth appear to be «all inclined differently, which shows for certain that they were not born in the so-called mines. If they were, they should at least be always found with their roots at the bottom»⁶⁴. According to Scilla, the frequent variety of fossils visible in a rock (shells, urchins, corals, etc.) and at the same time the partial proximity of fossils of the same type (i.e. of the same shape and weight) evokes the interaction between diluvial water whirlpools and the particular shape and weight of the animal being transported⁶⁵.

62 *Le Pitture Antiche Del Sepolcro De Nasonii Nella Via Flaminia [...] Disegnate, ed intagliate alla similitudine degli Antichi Originali Da Pietro Santi Bartoli. Descritte, & illustrate Da Gio. Pietro Bellori*, Rome 1680, tav. XXI.

63 Aldrovandi, *Musaeum Metallicum*, cit. (see note 30), p. 843 (see also pp. 464, 595, 938); K. Gessner, *De rerum fossilium, lapidum et gemmarum maxime, figuris et similitudinibus Liber*, Zürich 1565, pp. 162, 165; M. Mercati, *Metallotheca. Opus Posthumum*, Rome 1717-1719, p. 328.

64 *Vain Speculation* [2016], cit. (see note 6), [92-93] («L'osservarne [...] tutte con varia inclinazione, deve assicurarci ch'elle nate non siano nelle pretese miniere; che se fosse così, dovrebbero almeno osservarsi con la radice sempre sotto»: *La Vana Speculatione* [1996], cit. [see note 6], p. 75).

65 See also plate XV. «But, as far as I could tell, I always found a mixture of things in these heaps, even if most were of the same species. It therefore occurred to me that not just chance, but also the quality of the shape, may have played some part in what [89] we take as a marvel: chance might have determined the locations, creating eddies within the great floods, and the shape of the shell (or whatever) might have obeyed the clash and combination of those eddies»: *Vain Speculation* [2016], cit. (see note 6), [88-89] («Ma per quanto ho potuto osservare, sempre nelle dette raccolte di cose ho scorto mescolanza di più cose, bensì la parte maggiore d'una stessa spezie; sono entrato perciò in pensiero che non il caso solamente, ma la qualità delle figure possa aver avuto qualche parte in quel che ci apporta meraviglia; imperciocchè il caso può aver determinato il sito, formando i volvoli nelle grandissime inondazioni, e la figura della conchiglia o altro può aver ubbidito al conforme urto ed unione tra di esse [...]»: *La Vana Speculatione* [1996], cit. [see note 6], p. 73).

The fossiliferous blocks portrayed by Scilla, like Steno's diagrams, are landscapes of time, but based on directly visible forms. As compositions of various animals, they also evoke still lifes, of which Scilla was a highly regarded painter, as Grosso Cacopardo, one of his biographers, testifies. He among other things explicitly relates still lifes and Scilla's scientific research, both at a level of study and "copying" of the "surface"⁶⁶. We still know relatively little about Scilla's output in this field, although the sparse catalogue of his still lifes has recently been partly enriched⁶⁷. The relationship between the accurate depiction of fossils in *Vain Speculation* and his still life paintings is evident and has been already noticed by scholars. But there is a deeper level of connection, which concerns the "conjectural" value of the plates in Scilla's treatise and which, again, is directly linked to his training as an artist. Of course, the "compositions" of fossils of various animals on their rocky beds evoke the "compositions" of the recently deceased animals of his still lifes. But Scilla grasps a fundamental difference between the two types of "compositions", a difference that concerns their opposite temporal sense. The painted still life fixed recently deceased animals whose external beautiful appearance was still intact, albeit only for a short time. The theme of *vanitas rerum*, the inevitable end and destruction of beautiful natural forms runs through the tradition of this artistic genre. In contrast, for Scilla, the "still lifes of fossils" portrayed in some of the plates of *Vain Speculation* appear to overcome, at least partially, the action of time: the petrification of these animals has ensured and will ensure the preservation of their appearance, of their form for a very long time. In a long passage from the *Vain Speculation* he anticipates the potential resentment of his Maltese interlocutor for his description of Malta, «the pride of Christianity, the strong shield of the Faith, the Temple of the Catholic Mars», as being made from «fragments of animals». On the contrary, Scilla is keen to point out that God «allowed chance to work in accordance with his will» and that he created the island from clusters of fossilised animals: «Perhaps it was to show us that the teeth of devouring Time could do no damage to invincible Malta, which, marvellously toothed (a beauteous monster!), will remain for a thousand centuries, admired by its friends and feared by the angry and envious Ottoman dog»⁶⁸. The "philosophical" essence of this long and colourful

66 «Era eccellente Agostino non solo nelle storie, ritratti e teste di vecchioni, ma altresì ne' paesi, animali, fiori, frutta, e cose simili in che è reputato singolare. Dovea questa sua eccellenza alle profonde cognizioni acquistate nella storia naturale per cui minutamente osservando tutti gli esseri di natura, dopo averli diligentemente studiati, li copiava colla massima esattezza, insegnando così a' pittori con qua' mezzi si giunga alla perfezione»: G. Grosso Cacopardo, *Memorie de pittori messinesi e degli esterei che in Messina fiorirono dal secolo XII, sono al XIX*, Messina 1821, p. 142.

67 Di Penta, *Agostino Scilla pittore di nature morte*, cit. (see note 7).

68 *Vain Speculation* [2016], cit. (see note 6), [46-47] («Dimando che V.S. non s'adiri con chi stima formata l'isola di Malta formata dopo la creazione del Mondo e con chi crede le glossopietre di essa frantumi d'animali [...] Non è ella l'onore della Cristianità [...] il Tempio del Cattolico Marte [...] Che se poi altri la crede un mucchio di denti, e di varie altre cose, le farà ingiuria? Non già perchè la somma provvidenza del Fattore operare al caso non discordante dal suo volere, al quale concordarono pure gli accidenti che petrific-

excerpt is that fossils confront us with natural forms that seem to have overcome the tenacious destructive work of time: they are still lifes of an opposite kind to those portrayed in his paintings as symbols of *vanitas rerum*. And, again, a scientific and philosophical reflection, entrusted to the images of fossiliferous beds and expressed in the quoted passage, is directly connected with Scilla's artistic training, with his doing science as an artist.

Art and science according to Scilla and its time: «bastantemente mi dà che fare la di lui superficie»⁶⁹

Agostino Scilla lived in Rome first as a young man in 1646-1649, when he worked with Andrea Sacchi, then definitively from 1678 until his death in 1700.

During these years, Rome is the epicentre of a series of events that directly touch upon the relationship between art and science, that is, the fundamental aspect of Scilla's work, an artist who does not illustrate a treatise for a scientist, but rather does science as an artist.

As already mentioned, some scholars have seen similarities between Scilla's and Leonardo's work; both were artists and both were interested in the study of fossils and geology.

The first printed publication of the *Treatise on Painting* in 1651 (Paris) stemmed from a general interest in Rome in Leonardo's ideas and manuscripts, brought about by Cassiano del Pozzo, who was connected to the Barberini and the Lincei.

Scilla's work certainly has aspects that refer to Leonardo. A similar juxtaposition of images against words dominates *Vain Speculation* and Leonardo's entire oeuvre.

As painters, they shared the ambition to tackle scientific problems thanks to their artistic skills of observation and representation of reality, and, as artists, the more or less rhetorical statement of philosophical ignorance and the exhibited distance from the scholarly world. Scilla's words («I am a man of this world, naked of good letters [...] I confess more and, namely, that I do not love speculative Philosophy so much to be unable to enjoy of this world without its help»; or: «I, though I am an ignorant painter»)⁷⁰, recall a famous passage in Leonardo's Codex Atlanticus (fol. 327v): «I

carono quelle ossa, forse per indicarci che il tempo distruggitore non intaccherebbe con il suo dente l'invitta Malta, la quale maravigliosamente dentata (mostro bellissimo) riposerà per mille secoli vagheggiata da gli amici e temuta dal rabbioso e invido cane Ottomano»: *La Vana Speculatione* [1996], cit. [see note 6], p. 54).

69 «The human exterior is task enough for me»: *Vain Speculation* [2016], cit. (see note 6), [75]. See below for the whole passage.

70 *Vain Speculation* [2016], cit. (see note 6), [8] and [40] («Io sono un'huomo di questo mondo, nudo di buone lettere... Confesso di più di non essere a segno tale innamorato della Filosofia speculativa, che stimi di non potere godere di questo mondo senza il suo mezzo»; o «ch'io, benchè ignorante e Pittore»: *La Vana Speculatione* [1996], cit. [see note 6], pp. 36, 52).

know well that, since I am not a man of letters, some presumptuous person will think it reasonable to blame me for being a man without letters» («So bene che, per non essere io litterato che alcuno presuntuoso gli parrà ragionevolmente potermi biasimare coll'allegare io essere omo senza lettere [...]»).

It is very likely that Scilla at least knew Leonardo's *Treatise on Painting*, which was then available in print and perhaps, but almost certainly after the compilation of *Vain Speculation* (c. 1768-1771), he saw the Codex Leicester which included geological themes.

However, while general similarities certainly do exist, I believe that from a historical point of view the differences are far more interesting.

Meanwhile, one only needs to open the Codex Leicester and, in general, Leonardo's manuscripts to notice a macroscopic difference: the almost total lack, in Leonardo's case, of drawings of fossils, of which he left almost only verbal descriptions. Leonardo uses drawings to represent the geological events that generated the fossils (the motion of water, the effects of erosion, the general dynamics of the earth, etc.). His drawings are deeply "causal" and systematically "conjectural" and dynamic. In contrast, Scilla's work is totally dominated by representations of fossils and animals, which at times certainly include a "causal" and philosophical level, but are primarily intended to represent forms and not functions.

This opposite visual approach of two artists to the same scientific problem is the result of a radically changed art-science relationship. The very rhetoric of the "artist naked of good letters" has a substantially different meaning in the two cases and, in Scilla's case, it seems to be used in response to a very specific context, that is the 17th century discussion of an artist's scientific knowledge.

In 1664, the art writer Giovanni Pietro Bellori gave a lecture at the Accademia di San Luca in Rome. Bellori's general point was the primacy of the *idea*, i.e. mental invention over direct observation and imitation of reality, in the process of artistic invention. The lecture was then published in 1672 as an introduction to his *Lives* and had a wide echo, becoming part of a more general theoretical-artistic debate⁷¹.

Around 1680, the Roman painter Carlo Maratta produced a drawing, later engraved by Nicolas Dorigny (1704-1710 and, later state, 1728), which, both visually and in the text underneath, clearly defined the limits of the artist's scientific training (fig. 10). The meaning of the drawing, praised by Bellori in his life of Maratta⁷², is an invitation to strongly limit («tanto che basti»: just enough) the study of scientific things such as anatomy, geometry and perspective, giving ample space to the study of ancient

⁷¹ Giovanni Pietro Bellori, *Le vite de' pittori, scultori e architetti moderni*, E. Borea (ed.), G. Previtali (introduction by), Turin 1976; F. Bologna, *I metodi di studio dell'arte italiana e il problema metodologico oggi*, in *Storia dell'arte italiana*, G. Previtali and F. Zeri (eds.), I, 1, Turin 1979, pp. 165-182, in part. pp. 169-181; T. Montanari, *L'età barocca. Le fonti per la storia dell'arte (1600-1750)*, Rome 2020, pp. 36-37, 99-101.

⁷² Giovanni Pietro Bellori, *Le vite de' pittori, scultori*, cit. (see note 71), pp. 629-631.

statues and purely artistic subjects. The note «tanto che basti» appears in relation to the representation of anatomy (which is being explained by Leonardo himself), geometry and perspective. Maratta's representation was a very precise reaction to an intensification of the scientific components, particularly anatomy, in the teaching of art promoted at the Accademia di San Luca by Carlo Cesi⁷³.

The Academy was indeed the epicentre of many events relevant to our reconstruction. Scilla joined the Accademia di San Luca in 1679 and held important positions there in 1681 and 1688⁷⁴. The rediscovery in Rome in these years of Leonardo's Codex Leicester in 1689 (or 1690) is also in some way linked to this institution, because Leonardo's codex was rediscovered by the painter Giuseppe Ghezzi (1634-1721), Secretary of the Accademia di San Luca, among the papers belonging to the heirs of the sculptor and hydraulic engineer Guglielmo della Porta (1515-1577). Ghezzi's interest in this manuscript and its circulation in Rome by the great Renaissance artist-scientist goes in the direction of a strong link between art and science, and a few years after its acquisition, the young painter Pier Leone Ghezzi, Giuseppe's son, was proud to draw self-portrait of himself with a text by Leonardo on his back (London, Private collection). After all, when at Giuseppe Ghezzi's request the cultured Sebastiano Resta, a central figure in the Roman antiquarian market at the time, drew up the contents of the current frontispiece of the Codex Leicester, which praises Leonardo's talents as a hydraulic engineer, he was taking up a tradition that had already begun in the 16th century, which had made Leonardo a model of intellectual emancipation for many artist-engineers⁷⁵. Apart from his frequent attendance at the Accademia di San Luca, Agostino Scilla appears to be in contact with some of the actors of the reconstructed events, from Bellori to Ghezzi and Resta⁷⁶. In the *Vain Speculation*, one can identify a clear stance on the part of the Sicilian artist on the debated problem of the relationship between art and science.

On the one hand, Scilla clearly distances himself, almost line by line, at least on some points, from Bellori's *Idea*; on the other, he opts for an interesting compromise between Maratta's «tanto che basti» and the greater connection between art and science promoted at the Accademia di San Luca by Carlo Cesi. The reference to Leonardo should be contextualised within this specific Roman context⁷⁷.

73 S. Pierguidi, *Tanto che basti la 'notomia' nelle arti figurative di età barocca e nel pensiero di Carlo Cesi e Carlo Maratti*, "RIHA Journal", 177, 30 luglio 2017.

74 Hyerace, ad vocem *Agostino Scilla*, cit. (see note 1).

75 D. Laurenza, *The History of the Codex Leicester after Leonardo (16th-early 19th century). Towards a reconstruction of Leonardo's legacy as a scientist*, in *Leonardo da Vinci's Codex Leicester: A New Edition*, D. Laurenza and M. Kemp (eds.), Oxford 2019-2020, II [2019], pp. 133-233.

76 Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 80 note 299, pp. 91-92 note 623.

77 For an initial analysis of Scilla in relation to Bellori, Maratta and Leonardo's 17th century revival see Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), pp. 1224-130 and, on Scilla and Leonardo, cf. Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), i.e. pp. 36-39 e 261-262, in both cases with conclusions that are partly different from those proposed here.

Giovanni Pietro Bellori, in function of the invention of artistic beauty, contrasts artists who positively use the «imagination» with «those who glory of the name of naturalists» and «do not propose any ideas in their minds, they copy the defects of bodies... swearing too in the model as their preceptor, which taken out of their eyes, all art departs from them». Bellori compares the latter «to Leucippus and Democritus, who with vain atoms at random compose the bodies», i.e. to the ancient materialist philosophers. At the same time, «taking office away from the mind and giving everything to the sense», naturalist painters are compared to the ignorant vulgo («Where the people refer everything to the sense of the eye, they praise things painted in the natural state, because it is so painful to see them so made [...]»)⁷⁸.

Vain Speculation is a point-by-point reversal of Bellori's position. Apart from the general overturning of the priority relationship between “sense” and “mind”, the only philosophy which seems to find favour with Scilla is that of the «great Democritus» and Epicurus, often cited or evoked in his text, with the latter also being the subject of an unusual portrait he fashioned in the style of Ribera⁷⁹. At the same time, Scilla proudly connects his observational knowledge as an artist with knowledge of the vulgar, contrasting both with the empty knowledge of “philosophers”. The painter's conclusions, based on direct observations unclouded by preconceived mental constructions, coincide with the good “common sense” of the people. Scilla's intuition that the stones in the shape of sea animals seen in Calabria are the result of the ancient presence of water coincides with popular belief and is commented on as follows: «Yet in the end I realised that ‘Plus sapit vulgus, quia tantum, quantum opus est, sapit’ of any philosopher [...] the Truth being a matter so simple to understand, that nothing more»⁸⁰; and, on a similar subject: «Yet every cowardly fisherman has more certain and better information about it than many good philosophers». The “ignorance” of the painter, in the sense of distance from the empty theories that obscure the clear,

⁷⁸ See G. Previtali, in *Giovanni Pietro Bellori, Le vite de' pittori*, cit. (see note 71), p. XXXVII on this novel and clearly negative association between popular knowledge and philosophical scepticism. *Giovanni Pietro Bellori, Le vite de' pittori, scultori*, cit. (see note 71), pp. 14, 22: «Questa idea [...] animata dall'immaginativa dà vita all'immagine [...] Al contrario quelli che si gloriano del nome di naturalisti non si propongono nella mente idea alcuna, copiano i difetti de' corpi...giurando anch'essi nel modello come loro precettore, il quale tolto da gli occhi loro, si parte da essi tutta l'arte [...] sono simili a Leucippo e a Democrito che con vanissimi atomi a caso compongono li corpi [...] togliendo l'ufficio alla mente e donando ogni cosa al senso [...] i pittori naturalisti ricordano il volgo ignorante [...] Là dove il popolo riferisce tutto al senso dell'occhio, loda le cose dipinte al naturale, perchè è solito vederne di sì fatte [...]».

⁷⁹ *La Vana Speculatione* [1996], cit. (see note 6), pp. 27, 37-38. See P. Rossi, in *ivi*, p. 17; L. Hyerace, *Un nuovo “filosofo” di Agostino Scilla*, “Archivio storico messinese”, 91-92, 2010-2011, pp. 451-455; Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 53, 156 («la rivalutazione morale di Epicuro e del ‘grande Democrito’»); Ead., *L'epicuro di Agostino Scilla*, in *I filosofi antichi nell'arte italiana del Seicento*, S. Albi and F. Lofano (eds.), Rome 2017, pp. 127-160.

⁸⁰ *La Vana Speculatione* [1996], cit. (see note 6) p. 39: «Pur'alla fine m'avvidi che “Plus sapit vulgus, quia tantum, quantum opus est, sapit” di qualunque filosofo [...] essendo il Vero faccenda cotanto semplice a capirsi, che niente più».

simple, evident vision and understanding of phenomena, coincides with that of the people⁸¹.

Leonardo's theme of the painter as «omo senza lettere» (man without letters) therefore has in Scilla's case a specific target: Bellori and, more generally, anti-naturalistic artistic theories.

But, and this is a fundamental difference, the artistic naturalism that Scilla has in mind is quite different from that of Leonardo and the Renaissance. The drawings of fossils and animals that illustrate *Vain Speculation* and which stem from Scilla's work as a painter obviously have a demonstrative purpose and therefore an interpretative, theoretical meaning, but the theory is elaborated without ever losing sight of the object of analysis. On the contrary, in Leonardo's naturalism, direct observation is followed by a strong theoretical elaboration, and his drawings primarily express this "causal" dimension: in actual fact, water does not directly show the lines of force that animate his drawings.

The subject of Scilla's drawings are the forms which are macroscopically, directly, observed at length and the plates in this Sicilian painter's scientific treatise truly seem to be a scientific, albeit somewhat late, counterpart to Caravaggio's art, a counterpart that a great art historian, Ferdinando Bologna painstakingly sought in Galilean science but, according to many scholars, never managed to find⁸². In any case, the connection between the plates in *Vain speculation* and Scilla's still lifes is an aspect that certainly deserves further investigation in the future. Not only because of the long-standing Caravaggio tradition in Southern Italy but also due to the strong interest in Flemish art in the Messina milieu of the wealthy Ruffo family, frequented by Scilla, which had direct contacts with the Flemish still lifes painter Abraham Brueghel, then in Rome⁸³.

Returning to the Bellori/Maratta conundrum, if Scilla's "naturalism" is in clear opposition to Bellori's art theory, the painter from Messina instead accepts and adapts at least one aspect of Maratta's position to his work as an artist-scientist. By limiting his work to the analysis and representation of the "surface" of fossils and animals, without encroaching too much on either the microscopic or the theoretical dimension of scientists (that is the great theories of the earth that were beginning to emerge), Scilla, in a certain sense, accepts, in a scientific context, Carlo Maratta's artistic prescriptions. By even claiming to do science as an artist, Scilla is the antipode of Maratta. But in the way he implements his programme, limiting his intervention to macroscopic visual comparisons, he seems to retain something of the distinction between fields advocated by Maratta.

81 *La Vana Speculatione* [1996], cit. (see note 6), p. 69: «Eppure ogni vil pescatore ha di ciò più certa e maggiore notizia di tanti bravi filosofi». See also p. 36: «imperito e poco coltivato nelle buone lettere»; p. 39: «mezzo arrossito dalla mia trivialità»; p. 50: «Sono pittore e giuro da pover'uomo che si comporrebbe [...]»; p. 52: «benchè ignorante e pittore».

82 F. Bologna, *L'incredulità del Caravaggio e l'esperienza delle "cose naturali"*, Turin 2006, pp. 138-190.

83 Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 48, 54, 75.

As we have seen, Maratta limited the anatomical knowledge of artists. From this point of view, one of Scilla's texts that deals with the anatomical knowledge he had acquired as an artist is very significant: «I am not very well acquainted with the smallest parts or substance of man the microcosm; nor do I understand all his passions enough to speak freely of his composition. The human exterior [*superficie*] is task enough for me, and I consider that I have done my duty if, from time to time, I have contemplated man stripped of his top layer, so as to comprehend the necessary sentiments that must be expressed in the drawing of figures»⁸⁴.

His anatomical knowledge, as an artist, was limited to the surface of the body and up to the surface muscles; thus it fell within Maratta's «tanto che basti».

From a more strictly artistic point of view, while Leonardo's artistic forms always bear traces of the scientific research that was an integral part of their genesis, Scilla's artistic works, with the significant exception of his still lifes, usually have no significant link with his scientific and geological research. In some cases the exceptions are on a purely metaphorical base, as in the case of the personifications of the seasons in the paintings now found at Holkham Hall⁸⁵ or in metaphorical representations of the four elements in the still life of a private collection⁸⁶.

Compared to Maratta, Scilla's opts for a compromise position. He tries not to invade the methodological ambit of the scientists and limits himself, as an artist, to the surface of the natural forms being analysed (Maratta's "just enough"). However, at the same time, since his intent is to do science as an artist, he actually seems to revive the Renaissance and Leonardian tradition.

This compromise is indicative of the difficult and complex relationship between art and science in Scilla's time. We have seen some views on this in the artistic field. Let us look at how the scientific environment approached the question.

After re-emerging in an artistic context at the end of the 17th century, Leonardo's Codex Leicester began to circulate during the first half of the 18th century. Manuscript copies were produced that made its contents more comprehensible. A second albeit less known revival of interest in the great artist-scientist had recently emerged in Leonardo scholarship, one which would prove to be just as important as the one that had led to the printing of the *Treatise on Painting* in the mid-17th century

In 1717 the Codex Leicester was in Florence, to be copied on behalf of Thomas Coke, who had recently acquired it. Here, in the same year, the director of the grand

84 *Vain Speculation* [2016], cit. (see note 6), [75] («Io non sono tanto informato delle minime parti e della sostanza di che consta il microcosmo dell'huomo, né [ne] ho ben compreso tutte le passioni di esso, sì che possa parlare con libertà della sua composizione; bastantemente mi dà che fare la di lui *superficie*, e m'è paruto di compiere col mio obbligo, se alle volte l'ho considerato privo della prima scorza per comprenderne i necessarij sentimenti che devono esprimersi nel disegno delle figure»: *La Vana Speculatione* [1996], cit. [see note 6], p. 67: my emphasis).

85 See reproduction in Hyerace, *Ancora su Agostino Scilla*, cit. (see note 2), p. 266.

86 Marini, *Due nature morte di Agostino Scilla*, cit. (see note 7).

ducal printing press Tommaso Buonaventuri, who was involved in the first Florentine edition of Galileo's works, wrote to the scientist Guido Grandi, one of Galileo's pupils, that he had seen Leonardo's Codex. He wanted to include it in an edition of the major scientific writings on hydrology that he was editing, but the cost of a copy of the manuscript was considerable and, all things considered, the work seemed to him to be just of historical interest. So, in the end, Leonardo's work was not included. And a passage in the preface to the edition of hydrological writings reveals that this was a distancing of a specific scientific environment from the scientific work of an artist-scientist. In this passage Buonaventuri contrasts the true hydrological science of the scientists with that of the artists who claimed to deal with hydrological problems thanks to their drawing expertise⁸⁷. The increasing weight in science of theories, mathematical elaboration and the demonstrative side of Galilean science, beyond its purely visual or observational side, helps to explain this attitude⁸⁸.

But besides this Italian episode in which the world of science seems to want to distance itself from that of artists with scientific ambitions, there are also different positions in the scientific world.

In 1691-1693, shortly after his journey to Rome, the great Leibniz wrote, in accordance with a more Baconian sensibility, of the importance for the progress of science of the empirical knowledge of craftsmen and artists that was submerged in never published manuscripts⁸⁹. Does he also have in mind Leonardo's Codex Leicester that came to light while he was in Rome? We have yet to find evidence of this. It is certain however that Leibniz got to know the artist-scientist Agostino Scilla and his work on fossils, which would influence *Protogaea*, Leibniz's geological treatise in various ways as we shall see below.

This same scientific sensibility of a more empirical and Baconian kind was at the basis of two episodes in early 18th century England that again saw the association of two artist-scientists: Leonardo and Scilla. The interest in Leonardo shown by London's scientific circles linked to the Royal Society was the context for the production and publication of the first English edition of the *Treatise on Painting* in 1721 (*A Treatise on*

87 «Così Archimede, il Galileo, il Castelli, il Michelini, il Borelli, il Mariotte, ed altri vivi, e morti matematici molto ben divisarono circa l'architettura dell'acque, e de' fiumi senza niente disegnare, e dipingere; e niente in ciò operarono Raffaele, Tiziano, il Correggio, il Callotte, Stefano della Bella, ed altri perfetti disegnatori; e così si potrebbe dimostrare, ed esemplificare di molte altri»: T. Buonaventuri, *Raccolta d'autori che trattano del moto dell'acque*, I, Florence 1723, p. X.

88 In general see C. Maffioli, *La via delle acque (1500-1700): appropriazione delle arti e trasformazione delle matematiche*, Florence 2010, p. 31; Id. *Le acque tra concezioni filosofiche e saperi pratici*, in *Il rinascimento italiano e l'Europa*, A. Clericuzio et alii (eds.), V, *Le scienze*, Treviso 2008, pp. 529-549.

89 *Discours touchant la méthode de la certitude et de l'art d'inventer pour finir le disputes et pour faire un peu de tems des grands progress*, in *God. Guil. Leibnitii, Opera Philosophica quae Exstant Latina Gallica Germanica Omnia*, J.E. Erdmann (ed.), Bern 1840, pp. 172-176. See D. Laurenza, *The study of fossils in Leibniz's Protogaea: towards a reconstruction of the role of technological models in early modern paleontology*, "Earth Sciences History", 38/1, 2019, pp. 1-15.

Painting, by Leonardo da Vinci, London, 1721), two years after the arrival in London of the Codex Leicester and its beautiful and clear manuscript copy commissioned by Thomas Coke. This was also the environment that welcomed the work of another artist-scientist: Agostino Scilla. As we shall see better as we reconstruct the critical fortune of Scilla's book, William Wotton, Fellow of the Royal Society, published in 1696 an English summary with illustrations of Scilla's book and exalted its scientific merits as the work of an artist rather than a philosopher, accusing the naturalist John Woodward of plagiarism, a quarrel that lasted at least until 1728, when Woodward finally acknowledged his debt to Scilla.

Against the background of all this, one can understand Scilla's choice to take a compromise position, his wanting to do science as an artist by limiting himself to the aspect of things directly visible with the eyes, even if, at times, simply magnified by an «occhialino». This aligned Scilla's "doing science as an artist" on the one hand with Maratta's «tanto che basti» on the other with the observational naturalism of Caravaggian tradition, based on the careful, long observation of the object to be portrayed⁹⁰. But at the same time it put Scilla in a partly anti-Galilean position. This is an underestimated aspect of his work. While, as all authors have rightly noted, his work is certainly a filiation of the observational science of the Lincei and Galileo, at the same time Scilla distances himself from Galilean science when it implies the abandonment of the senses, in its more mathematical and theoretical aspects.

The Copernican heliocentrism embraced by Galileo seems to Scilla to be just one of many possible theoretical «systems» «despite the evidence of every living person's eyes», which see the sun revolving around the earth⁹¹. This same visual radicalism again leads Scilla to contradict Galileo regarding the existence in the distant past of humanoid giants, rejected by the latter in his *Discorsi e Dimostrazioni matematiche intorno a due nuove scienze* (Leida, 1638) on the basis that human bones, designed for a different body size, were unable to withstand greater volumes and body weights. Again, in his *Discorso de' Giganti*, which is part of one of his manuscripts on various

90 Bologna, *L'incredulità del Caravaggio*, cit. (see note 82), pp. 138-190.

91 «Hence I am not ashamed of my perplexity, but keep calm whenever I reflect on hypotheses about the great machine of the Universe. One of them was very firmly established by Ptolemy, who distributed its parts, whether stable or rotating, with clear and valuable demonstrations; but others, with no less clear demonstrations, brought it all down, unhinged the earth, and halted movement itself despite the evidence of every living person's eyes. And human intellects will infallibly find ways to use philosophy to deny both these system and preach many others, whenever the goal of their speculations is to innovate rather than to track down the truth»: *Vain Speculation* [2016], cit. (see note 6). («[...] quindi avviene che non ho vergogna della mia perplessità, e maggiormente m'acqueto, sempre che fo riflessione alle ipotesi della gran macchina dell'Universo, fra le quali essendone stata una con tanta forza fondata da Tolomeo, che con sì chiare e preziose dimostrazioni distribuì le parti di esso, o stabili o raggirevoli; altri con minor chiarezza di dimostrazioni ha crollato il tutto, ha discardinato la terra ed inchiodato il moto istesso a dispetto de gli occhi d'ogni vivente. Né mancherebbono maniere all'umano ingegno, filosofando di negare l'uno e l'altro sistema e di predicarne molt'altri, ogni qualvolta il pensiero d'innovare, non obbligo di rintracciare la verità, fosse lo scopo delle sue speculazioni»: *La Vana Speculatione* [1996], cit. [see note 6], p. 37).

subjects, Scilla contrasts the Galilean “reasoning” based on mechanics with “the observation of nature”, i.e. the reconstruction, on the basis of bone findings of a giant, a reconstruction to which the *Discorso* is dedicated⁹².

Paolo Rossi, paraphrasing Mersenne (*Vérité des sciences*), writes that «between the universe of physics and that of sense experience, a much deeper chasm has opened up in the modern age than that imagined by sceptical philosophies»⁹³.

Scilla intends to show that one could still do science by limiting oneself to «sense experience», the sphere most common to the artist. On the contrary, at the beginning of the 17th century, the painter Ludovico Cigoli, a friend of Galileo, used a telescope to observe the moon and the heavens, going, “as a scientist”, beyond direct sensory experience, and then portraying, “as an artist”, the moon seen with the telescope, i.e. with all its imperfections, its mountains and valleys⁹⁴; while Robert Hooke became one of the greatest scientists of his time by making systematic microscopic observations which he then succeeded in representing in magnificent plates, drawing on his original training as an artist.

Scilla tries to reduce the “confusion” between the two dimensions without giving up doing science as an artist. Since he was aware that during the 17th century, science, unlike art, had discovered horizons of investigation that went far beyond the directly visible, and choosing to limit himself to this latter dimension, he ultimately reaffirmed the gnoseological value of the artistic work in its most proper and autonomous form. He thus took note of the divarication that had occurred, but, at the same time, demonstrated that, at least in certain fields, it was still possible to do science by limiting oneself to the surface of objects, to their direct visual experience.

The frontispiece of Vain speculation

The comparative aspect is definitely a crucial element in the overall importance Scilla attributes to images, as compared to the verbosity of the erudite texts, so favoured by scholars. This also emerges in the introductory apparatus of the book and, in particular, in its famous frontispiece (fig. 11).

The primary importance of visual demonstrations is emphasised in the various dedications and poems introducing the work.

92 Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 573-616.

93 P. Rossi, *La nascita della scienza moderna in Europa*, Bari 2015, p. 123-124.

94 E.A. Reeves, *Painting the heavens. Art and science in the age of Galileo*, Princeton 1997; *Il Cannocchiale e il pennello. Nuova scienza e nuova arte nell'età di Galileo*, exhibition catalogue (Pisa, Palazzo Blu, 9 May-19 July 2009), L. Tongiorgi Tomasi and A. Tosi (eds.), Florence 2009; C. Damianaki, *Galileo e le arti figurative*, Rome 2000.

In the preface, addressed to the Marquis Carlo di Gregorio, Scilla underlines the importance of the plates in the structure of the work, pointing to the difficulty they caused him in order «to explain my idea with clarity»⁹⁵ and he contrasts the painter's knowledge based on the “eye” and “hand” against the verbose and empty knowledge of learned people⁹⁶.

This concept is reiterated in the «Sonetto del Sig. Dott. Giovanni di Natale» («These sea urchins, which are so vividly represented on paper / by skillful *hand*, high intelligence, sharp *eye*», my emphasis)⁹⁷, and in the other verses that emphasise the simultaneous presence of text (*calamo*: quill) and images (*graphio*: drawings), which means, as better explained by Scilla, a text that is in function of the visual demonstration («quando si discorre per mostrare, non per ispeculare», «when we talk to show, not to speculate», p. 55).

The famous frontispiece (fig. 11) confirms this primacy of the eye, as had also been emphasised in recent interpretations⁹⁸. However, in the light of the quoted passages and the general sense of the work, there is no need to go too far in interpreting the eye on the boy's chest as the “eye of the intellect”. Of course, the intellect is probably evoked, but the scene is dominated by the hand gestures that, on the one hand, touch and, on the other, reveal fossils and animals directly to the eyes. Reasoning, mental processing, but always, as happens in the artistic invention of a scene from Caravaggio, with the objects of reasoning and representation directly before the eyes.

At the same time, in the light of what has emerged in the course of our analysis, this frontispiece could also be the metaphorical representation of the contrast between the comparative method, aimed at finding close similarities between fossils and real animals, and the weak and vague similarities based on the many theories of figured stones, on the other. The male figure personifies the comparative method, accomplished through careful observation and visual documentation; indeed, he holds the animals (an echinoid and a tongue-stone) with his right hand, while he uses his left to indicate the corresponding fossils that closely resemble them. Instead the female figure not

⁹⁵ *Vain Speculation* [2016], cit. (see note 6), [2] («a fine di spiegare con chiarezza il mio concetto»: *La Vana Speculatione* [1996], cit. [see note 6], p. 33). Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), p. 121.

⁹⁶ «questa è composizione non già di uno che faccia professione di lettere, ma sì bene di un Pittore, il quale però pretende aver *occhio* a proposito per giudicare le cose, che possiamo *maneggiare* con più soda verità di coloro che sono meri professori di cieche speculazioni» (my emphasis): *La Vana Speculatione* [1996], cit. (see note 6), p. 34.

⁹⁷ «Questi Echini, che in carte al vivo espone l Franca *mano*, alto ingegno, *occhio* esquisito» (my emphasis): *La Vana Speculatione* [1996], cit. (see note 6), p. 30.

⁹⁸ From the “mind's eye”, recalled by the eye portrayed on the chest of the boy who symbolizes sense to the female figure symbolizing vain speculation: P. Rossi, in *La Vana Speculatione* [1996], cit. (see note 6), p. 18; Carpita, *Agostino Scilla (1629-1700)*, cit. (see note 5); Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), p. 120; Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), pp. 146-156. According to Carpita, the female figure seems to have no pupils and is therefore blind and frowning in her vain attempt to see.

only represents vain and verbose knowledge in general, but could also be a metaphor for generic similarities on the base of the many theories of fossils as jokes of nature; indeed, her hair is depicted as a direct continuation of the cloud and, therefore, this apparently human figure actually seems to be just a cloud which deceptively takes a woman's form. In fact, Scilla explicitly alludes to this in a text about the theories of the jokes of nature, typically attributed to those who want to see on walls «and in the clouds still [...] human figures, various animals, and infinite things»⁹⁹.

The scientific reception of the work of an artist-scientist

Scilla's treatise became well known in England as early as 1693-1695¹⁰⁰; it was to influence Leibniz's *Protogaea* (1691-1693, published in print in 1749) and Benoit de Maillet's *Telliamed* (1749) and a Latin edition was prepared in the mid-eighteenth century, (Rome, 1747, reprinted in 1756 and 1759), with a number of changes, which in some cases were arbitrary¹⁰¹, but in others quite significant¹⁰².

Early editors and readers of Scilla's work had already realized that the work's best feature lay in the plates and in their demonstrative and comparative content. The Latin edition, first published in Rome in 1747, offers special praise for the plates, and the index is accompanied by references to illustrations appearing in texts by other authors¹⁰³.

Let us take a closer look at two authors in particular who recognised and appreciated *Vain Speculation* as being the work of an artist-scientist: William Wotton and Gottfried Wilhelm von Leibniz

William Wotton, Fellow of the Royal Society, was the more acute interpreter of Scilla's work, as confirmed by his text published within the 1695-7 controversy concerning Woodward's assumed plagiarism from Scilla and others. He defended Scilla by remarking «tho Scilla be no Philosopher, yet he is a Painter, and such Men usually

99 «e nelle nuvole ancora [...] figure umane, animali varij e cose infinite»: *La Vana Speculatione* [1996], cit. (see note 6), p. 55. See also Findlen, *Agostino Scilla: A Baroque Painter*, cit. (see note 5), pp. 120-121, who, for this figure, quotes Emanuele Tesauro, *Il canocchiale aristotelico*, Turin 1654, on clouds as maximum «jokes of nature» for their restless changing form. See also Leonardo da Vinci's passages in the *Treatise on Painting* (e.g. § 66 in the edition by C. Pedretti and C. Vecce, Florence 1995).

100 Findlen, *The Specimen and the Image*, cit. (see note 5).

101 P. Rossi, in *La Vana Speculatione* [1996], cit. (see note 6), p. 20.

102 On Scilla's legacy see Rossi, *I segni del tempo*, cit. (see note 4), pp. 44-45; Id., in *La Vana Speculatione* [1996], cit. (see note 6), pp. 18-20; Di Bella, *Agostino Scilla collezionista*, cit. (see note 4), p. 64 and note 25. In addition to the Latin editions quoted by Rossi, in *La Vana Speculatione* [1996], cit. (see note 6), pp. 20-21 (Rome 1756, 1759 and a 1752 edition of which I have been unable to find), there is also a 1747 Roman edition «typiis Antonii de Rubeis in via Seminari Romani».

103 Scilla's treatise is accompanied by Fabio Colonna's *De glossopetris dissertatio*, another author who included illustrations, even if, as we have seen, to a more limited extent. On this edition see P. Rossi, in *La Vana Speculatione* [1996], cit. (see note 6), p. 20.

have pretty quick Eyes»¹⁰⁴. On the other hand, Leibniz had, as we have seen, a Baconian cult for scientific knowledge from the world of empirics and thus of artists: his interest for Scilla's book is confirmation of this.

Wotton was a key-figure in the understanding and potentially the dissemination of the most important aspect of Scilla's treatise. In 1696, in the *Philosophical Transactions* of the Royal Society of London, the most important scientific academy of the time, Wotton published a rich review of the painter Agostino Scilla's treatise¹⁰⁵. A large plate with a selection of images from Scilla's richly illustrated book accompanied his report (fig. 12). The plate included two different sets of representations: animals at the top with the corresponding fossils below. Wotton freely collected and adapted images which are found in different plates throughout Scilla's treatise and, in so doing, demonstrated his full understanding of one of the most innovative aspects of Scilla's book: the systematic and detailed visual comparisons between fossils and animals¹⁰⁶.

In the review of the work he presented to the Royal Society, after having noticed the «verbosity» of the introductory sections and summarized its theoretical part¹⁰⁷, Wotton is finally far more satisfied to introduce the comparative section on fossil teeth compared with those of living ones and points out: «Now he comes to particulars. He begins with the *Lapides Bufonitae*, which he proves to be the true Grinders of the *Sargus Dentex* and *Aurata* and other Fishes of that Tribe...» (p. 184), referring to the demonstrations illustrated in plate II of *Vain speculation*. But above all Wotton demonstrates that he is fully aware of the importance of Scilla's visual and comparative method, especially in the plate accompanying the extract (fig. 12), in which animal images collected from the various plates of *Vain speculation* are all concentrated in the upper part (Figures 1-7 and 9), while the lower section contains the reproductions of their corresponding fossils. The latter are always based on Scilla's plates and even presented in a more orderly fashion than their source, since Scilla does not always place animal parts and their corresponding fossils in the same plate. Thus, the shark's head, which Scilla presents at the end of the treatise (plate XXVII), and therefore far from

104 See Findlen, *The Specimen and the Image*, cit. (see note 5), p. 244. See *A Vindication of an Abstract of an Italian Book concerning Marine Bodies*, in J.A. [John Arbuthnot], *An examination of Dr. Woodward's Account of the Deluge, &c. With a Comparison between Steno's Philosophy and the Doctor's in the Case of Marine Bodies dug out of the Earth. By J.A.M.D. With a Letter to the Author Concerning an Abstract of Agostino Scilla's Book on the same Subject, Printed in the Philosophical Transactions. By W.W.F.R.S.*, London 1697, p. 66.

105 *La Vana Speculatione Disingannata Dal Senso: Lettera Risponsiva Circa i Corpi Marini, che Pe-trificati Si Trovano in Varij Luoghi Terrestri. Di Agostino Scilla Pittore Academico della Fucina, in Napoli, 1670. 4to. With short Notes, by a Fellow of the Royal Society*, London, "Philosophical Transactions", XIX, 219, February 1696, pp. 181-201. Published as anonymous but later vindicated by Wotton in Arbuthnot, *An Examination of Dr. Woodward's Account of the Deluge*, cit. (see note 104), p. 66.

106 For other aspects of Wotton's review and a full reconstruction of Scilla's complex reception in England between the end of the 17th century and the beginning of the 18th century see Findlen, *The Specimen and the Image*, cit. (see note 5), pp. 217-261.

107 «After a great deal of prefacing spent in Verbose Civilities», p. 182.

the representations of the various isolated teeth in plate I, actually opens the series of images of animals in Wotton's plate. It is possible that Wotton wanted to call attention to, or was influenced by a kind of image (the shark's head with the teeth in clear view) that had already appeared in Steno's book, and later been used by Leibniz, and which therefore had become almost canonical for this comparison between animal and fossil.

The comparative meaning of Scilla's plates was sometimes misunderstood, perhaps because the comparisons were not always orderly arranged in the painter's plates. Indeed, at least two misunderstandings are found in the use of Scilla's images by Leibniz and John Ray¹⁰⁸.

We have seen how one of the plates in Leibniz's *Protogaea* contains a graphic method of palaeontological reconstruction through dotted lines, which is similar to Scilla's (fig. 5). It is also known that in *Protogaea* Leibniz cites with admiration the work of «a learned painter», namely Scilla (p. 75 and p. 79)¹⁰⁹. The image in the top right of *Protogaea*'s plate VI is directly taken from *Vain speculation*'s plate VI¹⁰ (fig. 4). All the images of tongue-stones contained in this plate from *Protogaea* are connected with a chapter (chapter XXXI) in which Leibniz makes a precise mention of Scilla in relation to a series of comparisons between fossils (glossopetrae or tongue stones) and animals (shark teeth), and he also quotes the comparative plate by Steno and Mercati, which is even reproduced in *Protogaea* (plate VII). Leibniz justifies the images in his plate VI as a tool to prove the morphological identity between the Maltese tongue-stones with those found in Northern Europe. It should however be noted that the original figure in Scilla's book, which in the plate in *Protogaea* is indicated with «a» (just like the other tongue-stones «melitenses», i.e. from Malta) represents animal teeth and not a fossil. As we have seen, its purpose was to show that the bulge visible in some fossil teeth or near the base of tongue-stones was due to the mutual arrangement of the teeth in the animal's jaw. Perhaps Leibniz misunderstood the original meaning of the image and included it along with the other three images of fossil tongue-stones from Malta, whose origin is unknown to me (they do not appear in Scilla's plates). Alternatively, for some reason, Leibniz was unable to clarify the true meaning of these images at the top of his plate, with Nicolaus Seeländer, the artist who was author of the plates. Indeed, they apparently show a comparison between fossil teeth (the three drawings on the left) and animal teeth (the figure on the right), in the sense developed by Scilla. The inclusion of the plate derived from Steno/Mercati, a similar comparison between fossils and animals, and the quote in the text of many comparisons between

108 John Ray (*Three physico-theological discourses*, London 1693 and 1713: plate III, p. 162 in the 1693 edition, p. 204 in the 1713 edition) reproduces a sea urchin from Scilla's plate XXII presenting it as a fossil, while in its source it was an animal found in the sea by fishermen.

109 See for example Rossi, *I segni del tempo*, cit. (see note 4), p. 44; Id., in *La Vana Speculatione* [1996], cit. (see note 6), p. 18 and Findlen, *Projecting Nature*, cit. (see note 2), p. 124.

110 See also Findlen, *Projecting Nature*, cit. (see note 2), p. 131.

fossil teeth and animals might suggest that this was Leibniz's intention. Furthermore, one of the fossil teeth from Malta (the one in the centre) has a bulge at the root, which would explain the comparison with the living specimen, as in the case of Scilla's plate. Leibniz then mentions two aspects of Scilla's work: the search for precise morphological correspondences and not vague similarities¹¹¹ and the making of comparisons between fossils and animals¹¹², which are both aspects of the comparative method confirmed as being the fundamental aspect of Scilla's contribution to the history of geology. In the first case, Leibniz mentions Scilla's claim against the vagueness of the similarities invoked by advocates of the theory of figured stones and other similar theories; in the second case, he cites from the comparison made by Scilla between shark teeth and fossil tongue-stones, particularly with respect to their curvature which would have allowed their original position in the shark's mouth to be established.

APPENDIX

The London manuscript and an unpublished passage in the printed text

Scilla's almost certainly original manuscript (London, British Library, Add. Ms. 19934)¹¹³, includes a long and crossed-out text (ff. 99v-100r), not included in the book¹¹⁴. This text was, for some time, the closing text of the letter-treatise. Then at a certain point, it was decided to replace it with a new and longer text, which was printed in the book. The crossed-out text contains references to some ancient medals, a collateral argument in Scilla-Buonamico's correspondence, alongside the main debate about fossils, and can be linked to Buonamico's request for Scilla's opinion on some Greek medals¹¹⁵. Scilla mentions the first part of a numismatic work by Buonamico.

111 «Quibus pictorem doctum oppono, qui nuper libello edito asseveravit, multa talia ostentata sibi, sed quanto attentius aspiceres, eo longius a similitudine abfuisse»: *Gottfried Wilhelm Leibniz, Protogaea*, cit. (see note 58), p. 74.

112 «Et quemadmodum in his animalibus dentes plurimi incurvi sunt, atque introrsum versus gulam flexi, ita in Glossopetris, id est fossili dente, eadem figura apparet, ut dextra, an sinistra parte sederint, agnosci posse Scilla pictor notarit»: *Gottfried Wilhelm Leibniz, Protogaea*, cit. (see note 58), p. 78.

113 See Di Bella, *Le collezioni romane*, cit. (see note 4), p. 31, note 14; Id., *Agostino Scilla collezionista*, cit. (see note 3), fig. 1.

114 Pp. 105-107 in *La Vana Speculatione* [1996], cit. (see note 6); pp. 158 and ff. in the 1670 edition. Another passage not included in the book is on sheet 5r: «ipse cui maxima est ingenij eius acuminatos tractare [?] non nisi deliveras [?] echinos».

115 In his letter to Scilla, Buonamico asks him «del suo giudizio circa a certa sorte di medagliuicce Greche, ch'io da mille circostanze stimo esser monet degli ultimi imperatori Orientali, e qui la corrente vuole contro al senso, e la ragione, che siano assai più antiche, riferendole al terzo secolo» (*Lettera missiva del Signor Gio Francesco Buonamico Maltese Dottore di Medicina, Filosofo, e Poeta, diretta ad Agostino Scilla*

Perhaps the passage was crossed out because this quote would have revealed the identity of *Signor Dottor N.N.* or because it was different from the main argument of the letter-treatise. Corrections by an old reviewer are visible throughout the manuscript and in the cut text transcribed here¹¹⁶.

[f. 99v] Devo per ultimo¹¹⁷ dimandarle perdono del tedio, che di necessità ha patito per sì lunga e sconcia lettura, e devo anche rendere infinite grazie alla sua molta umanità per avermi arricchito d'infinite erudizioni, facendomi capitare la Prima Parte del suo trattato sopra le Medaglie vanamente credute di S. Elena; e le giuro in verità che non vorrei esser nato Greco per tutto l'oro del Mondo. Poder di Dio, ella fa invettive [?] contro quei sfortunati a tal segno ch'è uno spavento, e mi bisogne [f. 100r] rebbe sfuggire le autorità de' Greci scrittori indifferentemente, se in qualche luogo ella mitigata col fare loro carezze, valendosi della loro testimonianza, non mi¹¹⁸ persuadesse che ce ne dobbiamo¹¹⁹ servire quando ci torna conto. Del resto ho ammirato (ma non quanto merita l'Opera, perchè non ne sono capace) la forza e l'erudizione del detto suo degno parto, ed ho con vero¹²⁰ compiacimento goduto di vedere, come da una materia cotanto secca, maneggiata da chi sa, si possa formare un trattato totalmente pingue di nobilissime osservazioni. Iddio Nostro Sig.re la conservi lungamente,¹²¹ ch'io, mentre affettuosamente le bacio le mani, mi protesto

Di V.S. Molt'ill' aed Ecc.ma

Divotiss.mo Serviss.o
Agostino Scilla, Pittore.

messinese Pittore ed Accademico della Fucina detto lo Scolorito Data sotto li 28 agosto 1668 ove si tratta dell'origine delle glossopetre [...], in Opuscoli di autori siciliani, Palermo 1758-1771, XI, pp. 105-200, in part. p. 109).

116 The many corrections to the text which are included in the book can confirm Di Bella's hypothesis that this manuscript is the direct source for the book or at least a version very close to the final and printed work; see Di Bella, *Le collezioni romane*, cit. (see note 4). According to Giallombardo, *Agostino Scilla (1629-1700)*, cit. (see note 2), p. 158, n. 44, the corrections in the manuscript are not by Scilla but by the physician Carlo Fracassati, who we know saw the manuscript in Messina in 1670.

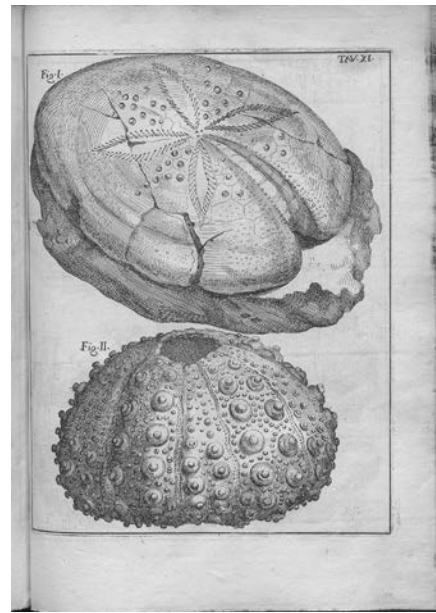
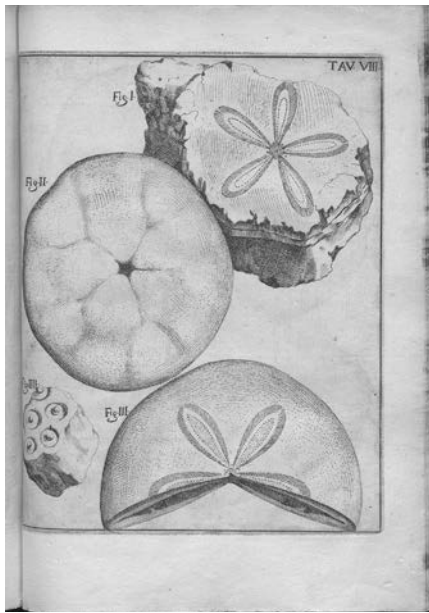
117 When Scilla decided to delete the following passage and include the new one that was finally printed, he maintained this beginning («Devo per ultimo»).

118 Deleted: «porgesse l'esempio».

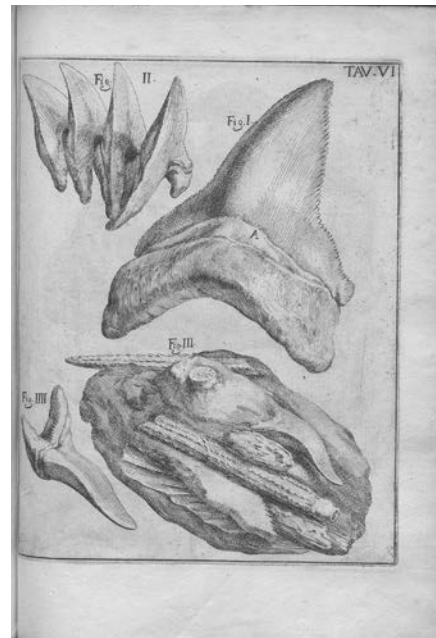
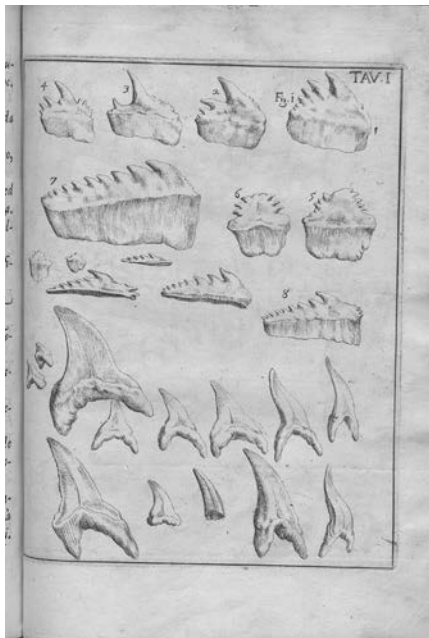
119 Deleted: «valere».

120 Deleted: «piacere».

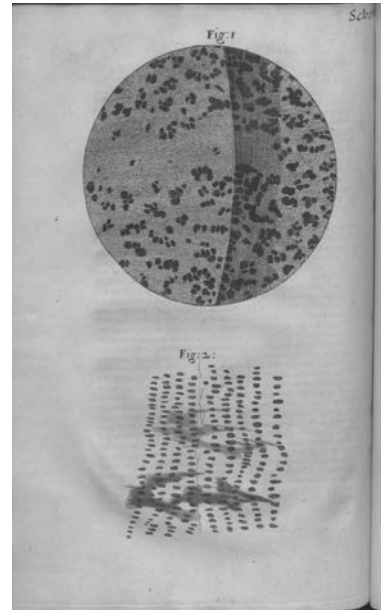
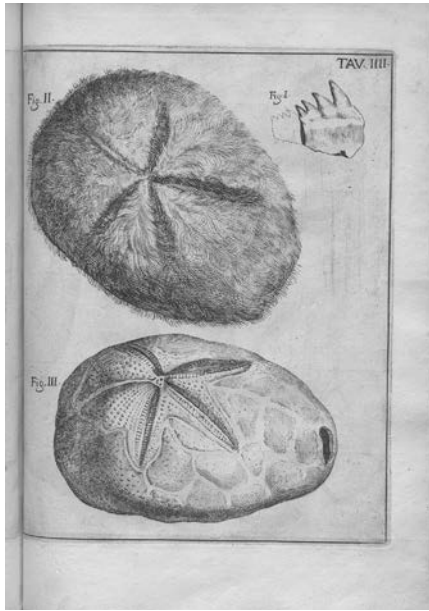
121 Deleted: «che».



1-2. Pietro Santi Bartoli (engraver), Agostino Scilla (draftsman), *Sea urchin fossils*, in Agostino Scilla, *Vain speculation undeceived by sense (La vana speculazione disingannata dal senso)*, Naples [Messina?] 1670-1671, plates VIII and XI, engravings, Zürich, ETH-Bibliothek, inv. Rar 2196



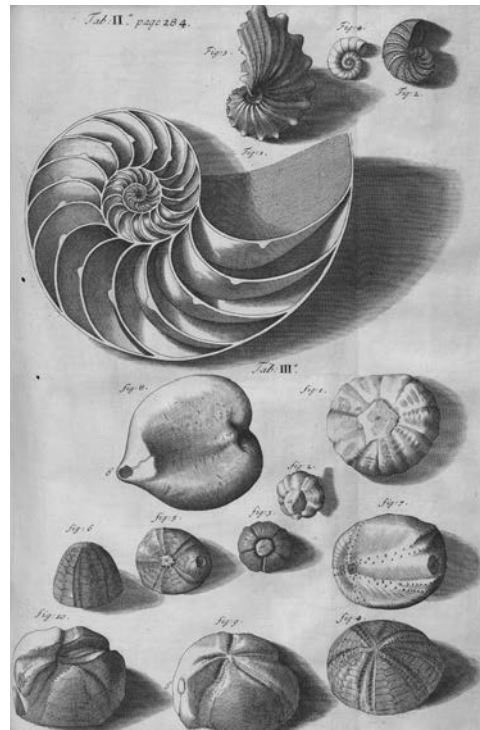
3-4. Pietro Santi Bartoli (engraver), Agostino Scilla (draftsman), *Shark teeth and fossils of shark teets*, in Agostino Scilla, *Vain speculation undeceived by sense (La vana speculazione disingannata dal senso)*, Naples [Messina?] 1670-1671, plates I and VI, engravings, Zürich, ETH-Bibliothek, inv. Rar 2196



5. Pietro Santi Bartoli (engraver), Agostino Scilla (draftsman), *Fossil and two living sea urchins*, in Agostino Scilla, *Vain speculation undeceived by sense (La vana speculazione disingannata dal senso)*, Naples [Messina?] 1670-1671, plate III, engravings, Zürich, ETH-Bibliothek, inv. Rar 2196

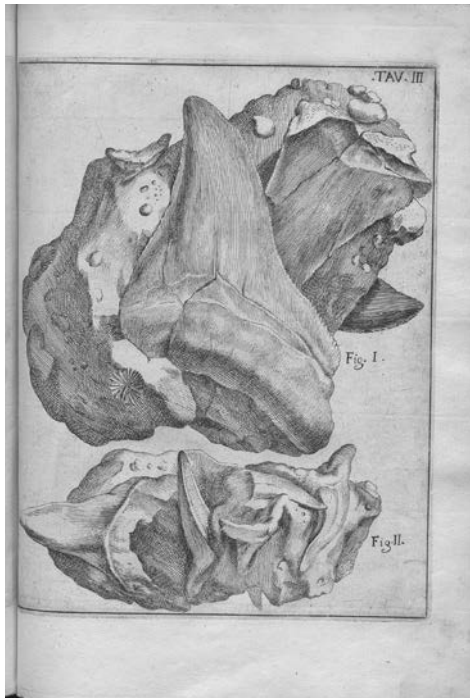
6. Robert Hooke, *Microscopic structure of fossil wood*, in Robert Hooke, *Micrographia*, London 1665, «Schem X», engraving, Zürich, ETH-Bibliothek, inv. Rar 10760

7. Robert Hooke, *Nautilus shell and fossil echinoids*, in Robert Hooke, *Posthumous works*, London 1705, plate II, engraving, Zürich, ETH-Bibliothek, inv. Rar 10429





8. Pietro Santi Bartoli, *Reconstruction with dotted lines of the missing parts of an ancient painting (at the bottom in the plate)*, in Pietro Santi Bartoli and Giovanni Pietro Bellori, *Le Pitture antiche del sepolcro de Nasonii nella via Flaminia*, Rome 1680, plate XXI, engraving, Heidelberg, Universitätsbibliothek, C 5976-8 Folio RES

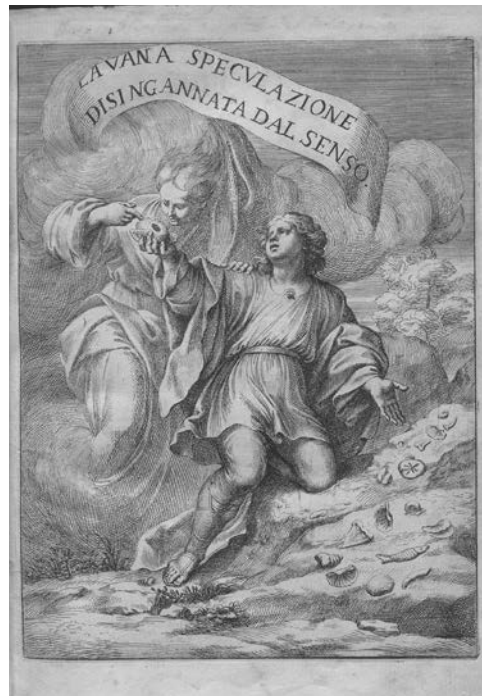


9. Pietro Santi Bartoli (engraver), Agostino Scilla (draftsman), *Fossiliferous blocks of rock*, in Agostino Scilla, *Vain speculation undeceived by sense (La vana speculazione disingannata dal senso)*, Naples [Messina?] 1670-1671, plate III, engraving, Zürich, ETH-Bibliothek, inv. Rar 2196

Nella pagina successiva, in basso:
 12. The plate brings together and arranges with order figures of parts of living and fossil animals after various plates in Scilla's book, in William Wotton, *La Vana Speculatione* [...], London, "Philosophical Transactions", XIX, 219, 1696, pp. 181-201, engraving. London, Royal Society



10. Nicolas Dorigny (engraver, c. 1704-1710), Carlo Maratta (draftsman, c. 1680), *Allegory of painting, with figures in a studio with the motto "Tanto che basti"*, engraving, London, The British Museum, inv. 1874,0808.1713



11. Pietro Santi Bartoli (engraver), Agostino Scilla (draftsman), *Allegory of the 'Vain speculation undeceived by Sense'*, in Agostino Scilla, *Vain speculation undeceived by sense (La vana speculazione disingannata dal senso)*, Naples [Messina?] 1670-1671, frontispice, engraving, Zürich, ETH-Bibliothek, inv. Rar 2196

