Gessner Studies: state of the research and new perspectives on 16th-century studies in natural history*

Philippe Glardon

Summary

The field of Gesnerian studies is still to a large extent underdeveloped. This statement sums up in a nutshell the state of research on the body of work of the Zurich physician. Yet, no place for pessimism in this succinct conclusion: in what follows we trace some major tendencies and developments in the study of the Gesnerian corpus. On the whole, it is mostly his illustrations that have drawn scholars' attention, providing interesting perspectives on art history and the representation of nature in the 16th century, as well as, through the study of the circulation of images, on the scholarly networks and knowledge communication in the Renaissance. The second part of this article builds on concrete examples to provide possible perspectives on the paratext of *Historia animalium*, and on the various additions made to it by its author. In conclusion, it appears that numerous aspects of the Renaissance perception of nature remain unexplored, but also that a reading that makes use of precise lexicological and statistical tools is necessary and promising. This conclusion is positive and seeks to highlight the network established between scholars from different domains of the humanities, and also the technical means available at present, which open new possibilities for comparison, exchange and collating of research information.

Keywords: Conrad Gessner, 16th Century, Natural History, Scientific illustrations

* Translated into English by Petya Ivanova

Philippe Glardon, Faculté de Biologie et Médecine, Université de Lausanne (philippe.glardon@unil.ch)

Fig. 1. Gessner, Pincer of *Astacus marinus*, *Historia animalium* IV, 1558, p 119

Pincer of *astacus marinus*, such as I have in my home, though slightly smaller. It can be represented through the painter's craft in the shape of a grotesque human face; indeed, the smaller part of the pincer evokes an enormous aquiline nose, and the excrescences on both sides – the eyes, which the painter would garnish with eyebrows. Up to four kinds of small horns can be seen above the nose and the upper part of the forehead: he should paint them in blue or another colour to suggest a headgear with ear-flaps falling on the temples and covering away the ears. There should be hairs ruffled behind and around the temples. The face should be partly covered in white pigment and partly lit up by pink purple. The bumps on the bigger part of the pincer that Rondelet calls teeth would be the tongue, and should be highlighted in red. And if you add a crest of curly feathers, preferably borrowed from the tail of a cock, a capon or a peacock, to be stuck in the aperture at the top, you will obtain the perfect figure of a terrible gorgon [...]¹

This introduction, combining a rigorous, “realistic” image and a text that to us, modern observers, seems totally incongruous, means to startle and draw attention to the two primary objectives of the lines that fol-

low – namely to present a brief state of the current research on Gessner's works, and concomitantly, on natural history in the 16th century. The aim will be, using several concrete examples, to show the significant advance in the study of Gessner's works, as well as the considerable still unmapped territories in the organization of this knowledge and its procedures. Second, we will suggest several research perspectives, based again on concrete elements, which we hope will stimulate further thought.

1 “Chela astaci marini, qualem et quantam domi habeo, sed paulo brevior. Pictoris artificio ita pingi potest ut facies hominis ridicula appareat; nam chelae pars minor maximum et aquilinum nasum refert: et quae in utrius partis confinio eminent verrucae, oculos, quibus supercilia pictor addet. Superiorem partem, quatenus ceu cornicula quatuor supra nasum et frontem eminent, caeruleo aliove colore inducet, ad representationem pilei auriti et ad tempora descendentes, ut lateant aures: retro et circa tempora pili promineant nigri. Facies partim albo inducatur pigmento, partim roseo fuco niteat. Linguae instar partis cheale majoris tubera (Rondeletius dentes nominat) fuerint, rubicundo colore insignienda. Quod si cristam quoque e pennis, caudae praesertim gallinae, capi aut pavonis nutantem, foramini summo indideris, plane gorgoneam terribilem habebis faciem.” (*Historiae animalium* IV, 1558, 119).

I. Reading, writing and depicting nature

At first glance, the modern observer will be struck by this splendid lobster pincer, whose detail and refinement of execution witness the famous spirit of observation attributed to Renaissance naturalists, following in the wake of the botanists ever since Otto Brunfels. As it has often been the case, one could settle with this convention, following the opinion of science historians starting with Georges Cuvier, who place Gessner among the most innovative spirits of his time. The Zurich physician possessed a collection of *naturalia*, which he enhanced with the help of numerous collaborators, heading what we would now call a proper scientific network. He possessed the means to commission original plates, which were then integrated in his works according to a methodology that involved a complex relation between illustration and scientific commentary. Regarding illustration technique, it should be mentioned that the pincer gravure above witnesses a fine approach to naturalistic description, in the line of what botanists call florets, or the sketch of a plant's anatomic details.

Further, one could also appreciate the erudition of the Zurich physician, at once with deference and a certain reserve, especially if one should read the text that accompanies, or complements the illustration, and which in the case of the *Astacus marinus* extends over the six pages preceding it (113–118).

Yet, the example of Gessner's commentary on this pincer taken from his collection shows the extent to which a further study of his written corpus and his treatment of the illustration and its links with the text would be appreciable. It is no exaggeration to speak of the abyss between our perception of pre-scientific texts, which is how we define naturalist production of the Renaissance, and the variegated perception of nature in the 16th century suggested in Gessner's lines.

We witness here the creation of a monster, penned by an author whose moderation and lucidity are unanimously celebrated by historians, in the spirit of naïveté and excessive imagination that would compromise the proper development of modern science [...].

One couldn't help thinking of the extraordinary anamorphic portraits by Guiseppe Arcimboldo, whose recognizable elements – fishes and shells, fruits, vegetables and other remarkably executed objects – shape by their accumulation a grotesque human torso, identifiable but disturbing in the vision it offers. It needs to be pointed out that Gessner's pincer engraving is presented vertically, in close to a full-page format. Clearly the aim is to suggest an anthropomorphic representation, and through the effect of size, to enhance its impressiveness.

It is the entire descriptive approach to nature of 16th-century naturalists that is at issue here. In order to understand this problematic properly, we need to put into question our categories of relevance. Gessner and his colleagues effect a translation, a transcription of nature making use of etymology just as well as of visual description; of dissection just as well as of literary commentary. Clearly, Gessner takes up the arms of a poet, disrupting the image of a scholar or a pre-scientific erudite that one could have made of him. In order to depict nature in its profusion and infinite variety, yet organized in intelligible terms, the naturalist needs to summon all the resources of human art, becoming a demiurge, as Leonardo da Vinci witnesses:

If the painter wishes to see beauty [...], he is its master and God. The divine nature of painting transforms the painter's mind in an image of God's spirit, as he engages with free potential in the creation of various species: animals of all sorts, plants, fruits, landscapes, countryside, mountain erosions, places of fear and horror which terrify the spectator, or places of charm, pleasure and sweetness. (*Treatise on painting*, c. 1485).

Nevertheless, warnings of all kinds abound in the treatises of naturalists physicians: pride threatens the artist and if he wants to depict the order of Creation, he needs to distinguish truth from falsehood, the artifice of human making from the formidable fruits of nature's "incredible power". In a way, Gessner plays with fire, going against the very rules of his own methodology. Beyond any doubt the decision to insert this plate in the work was his own, and not the editor's whim. From his correspondence we know that he had full control over the illustrations, which he commissioned and supervised closely. Maybe his purpose was to warn against the dangers of excessive human imagination? Or maybe, if he becomes a poet for a moment, it is not in order to replace the creator, but rather to pay homage to natural fantasy in this curious play between image and verbal portrait? The passage retains its mystery.

II. Knowledge and the interpretation of illustrations in Gessner's works

The two aspects of humanist strategies aiming at knowledge of nature have been given unequal attention by scholars. As a consequence, the complex and multiple relationships between word and image in the text description have not been fully understood.

Two major topics have solicited scholars' attention so far. The first one focuses on the research of the technical and artistic aspects of the production of the illustrations that come by hundreds in the treatises of natural history such as Gessner's: who are their authors, how are these images made before

being drafted, engraved and then inserted in the works, and sometimes even subsequently colored, what was the cost of their execution?²

The second point, closely related to the first one, is the question of the circulation of images – a truly exciting subject, which highlights Gessner's widely recognized role as a pole of attraction of European erudition. The recent and sometimes fortuitous discovery of yet unpublished funds in various libraries has allowed an even better knowledge of the network created by the Zurich physician, and has highlighted the intensity of object exchange among naturalists physicians.

On this subject, three recent publications should be mentioned. In my *Essay Review*,³ I have already talked about Baudouin van den Abeele's "The ornithological albums of Jacques Dalechamps, physician and naturalist in Lyon (1513–1588)", which has been followed by "Inventory in images: Renaissance albums of zoological plates". In this latter article, Baudouin van den Abeele, medievalist and eminent specialist on falconry, establishes relevant connections with medieval illustration and namely marginalia and draft books, reminding that "realistic" animal drawing did not originate *sua sponte* with naturalistic treatises in the middle of the 16th century. The author then presents a European overview of the albums of zoological watercolor sketches known so far.

It results from this rich contribution, pioneer in its kind, that a lot remains still to be done at different levels, a conclusion with which the present author concurs: at the basic level of detecting albums that are yet unknown, badly classified or unidentified;⁴ then at the level of the different axes of analysis. Some of the questions to be asked are: what is the primary structure of each collection; what are the filiation links between collections and stylistic units; what are the major catalyst poles; in what social milieux are these albums produced, who are their eventual commissioners and owners; or, from the point of view of the history of zoology, which are the dates of appearance of previously unknown species; what are the denomination procedures employed and how is the grouping into classification "genres" made?

Finally, we need to mention the approach of Florike Egmond, less synthetic but equally significant. The Dutch science historian has announced the discovery of two albums with zoological watercolor sketches related to the

2 Pinon 2000. I would like to thank the author for sending me a copy of his unpublished thesis. See in particular chapter 8, 398–423.

3 Van den Abeele 2002, Glardon 2006.

4 Dalechamps' albums, identified by Baudouin van de Abeele were found for instance among the manuscript funds of Medieval Latin texts at the French National Library.

Historiae animalium at a conference held in Lisbon in February 2012.⁵ Sign of the times, the circumstances around the discovery are presented on the web, in a blog where Egmond recounts in an engaging manner her findings.⁶ The corpus comprises more than 350 pages, divided in two notebooks collated by the physician Felix Platter (1536–1614), a student and friend of Gessner. The first notebook gathers water animals, vertebrates and invertebrates; the second - terrestrial animals, mammals, reptiles and insects. According to current practice, the paintings are cut out and pasted on folios. It is worth dwelling for a moment on the circumstances of this finding, reported by Egmond. In the early 1990s Egmond, at that time little experienced in the field of 16th-century illustration, chances upon two notebooks at the University library of Amsterdam, correctly classified, but without any identification (vol. iii C 22, 225 illustrated sheets, and iii C 23, 144 sheets). She interprets them as copies posterior to *Historiae animalium* and forgets about them until 2010. This is when she returns to these plates using the experience she has acquired in her work on Charles de l'Escluse (Carolus Clusius, 1526–1609), aiming to date the albums that she had previously situated simply as anterior to the end of the 18th century. The examination of the annotations, both Latin and German, and the comparison with the illustrations in *Historiae animalium* indicated a still earlier date for the albums' composition. Finally, a visit to the former paper mill already in function during Gessner's time, later become a museum of the paper press – the *Basler Papier-Mühle St Alban-Tal* – allowed her to date with certainty the watermarks and the sheets.

An interesting comparison can be made with a similar rediscovery that happened recently in New York:⁷ since 1889 when they were acquired, four albums containing a total of 215 watercolor sketches of birds, dated from the 18th century without further precision, were buried in the collections of the New York Historical Society under the simple mention *European birds*. In 2007, Roberta J.M. Olson and Alexandra Mazzitelli examined closely this disparate collection, containing plates from different origins and hands. While their article presents the details of the itinerary and the owners of the albums, the anecdote of this fortuitous discovery calls forth a number of comments. A systematic examination has shown that the execution of the illustrations dates from the second half of the 16th century. The oldest ones

5 *Libraries and the Scientific Book (XV–XVIII centuries): objects, spaces and ideas*, National Library of Portugal, 2–3 February 2012 (Centro Interuniversitário de História das Ciências e da Tecnologia (CIUHCT), <http://ciuhct.org/en>).

6 <https://picturingscience.wordpress.com/2012/03/11/gessner-drawings-university-of-amsterdam>. Publication : Egmond 2013; publication online 19th April 2012. Accessible links on the page.

7 Olson/Mazzitelli 2007. Many thanks to Baudouin van den Abeele, who brought to my knowledge and sent me a copy of this article.

were identified as part of the collection owned by Felix Platter, which he inherited from Gessner.

As far as the interpretation of the source is concerned, we leave the authors the responsibility of their conclusion: focused on the continuity in science development, they consider these albums from a Darwinist perspective as the “missing link” in the history of ornithologist illustration, whose “infancy” they situate in the works of Pierre Belon (*Histoire de la nature des oyseaux*) and of Gessner (pp. 436 et 443). The main interest of these albums seems to lie rather in the principle of their organization – yet another proof of the intention to compound valuable collections, both from esthetic and naturalist point of view.

In terms of analysis however, both the Dutch and the American collection have been subjected to a remarkably minute examination – *a sine qua non condition* to their relevant identification. Without such examination it is indeed difficult to know whether we are dealing with copies of works from the 16th century, a profusion of which was produced down to the 18th century, or, to the contrary, and much more rarely, the watercolors in question are earlier and thus precious witnesses of the genesis of these treatises. Further than the above-mentioned paleographic and technical criteria, there is still a lot to be done on the level of stylistic analysis. Indeed, any project on the collation of illustrations in natural history should be led in stimulating collaboration between art historians and scientists. The former can highlight the stylistic aspects, artists’ tics, details of the execution and other elements allowing to assimilate or to distinguish the artists, the sets of plates and the filiations between collections.⁸ The latter element can contribute to a specific identification, which will allow, from the perspective of science history, for a better knowledge of the species described and of the developments in historic zoo-geography.

Coming back to the 16th-century illustrations, the plates identified by the authors reveal the following elements:

- the names of Gessner’s correspondents
- the place of origin of the specimens
- the dates of their catching, finding or sending

⁸ In the case of birds for instance, one should pay attention to the postures, the representation of the articulations of the feet, the execution of the feather contours, the pigments and the color tone, the elements of decor etc. A remarkable aspect of the plates found in New York, highlighted by R. Olson et A. Mazzitelli is the conjunction between copying the attitude from Belon’s and Gessner’s engravings on the one hand, and a great liberty in the proportion of the birds’ size on the other – the latter is increased six times in the watercolors where the constraints of layout do not apply.

- meta-textual indications, numbers and letters, which are sometimes impossible to interpret, but which attest for attempts at classification, or simply for the existence of lost plates, indicating an even larger size of the collections
- denomination annotations
- morphological and anatomical annotations on the species represented

It is certain that all this collated data provides a stock yet to be explored, which will greatly enhance our knowledge of these notorious correspondence networks. It also provides significant information on the relevance criteria used in the description and classification practices of the naturalists.

The last point to be underlined concerns the different conditions of study of the two watercolor collections. We have mentioned the fortuitous circumstances that surround the discovery and the subsequent identification of the Dutch albums by F. Egmond. The work on the New York albums in contrast results from a systematic project: it was part of a regular cataloguing work of all 8000 illustrations in the collections of the *New York Historical Society*. This project could serve as an example for a number of European funds from the point of view of its approach as well as of its rigorous application: the two authors have called upon European experts and librarians to produce an accomplished, well-illustrated work, rounded off with a checklist indicating the size, the execution and the manuscript annotations of each plate.

Similarly, there are numerous funds containing Gessner's correspondence, which has appeared in printed volumes several times since the 16th century. Rather than focusing exclusively on excerpts from letters mentioning exchange of materials, Gessner's thoughts on the images or on the editorial adventures related to his works, or other isolated elements, it would be profitable to engage in a systematic study of this corpus.

III. The relationship between text and image in the 16th-century treatises on natural history

This second excerpt from the *Historiae animalium* recalls our initial observation made on the first illustration, and enhances its claim: if one may regret the incomplete readings of Gessner's texts, the same goes for the link, albeit essential, between image and text. A twofold conclusion can be drawn from this engraving after Olaus Magnus, bishop of Uppsala. It reminds us that in the 16th century, the criteria for the acceptance or rejection of an illustration based on its verisimilitude are very different from the ones we have today. On

Fig. 2. “Portrait of the *astacus marinus*, which the German call *Humer*, after the description of the Northern Regions by Olaus Magnus. He writes that it is enormous (between the Orkney islands and the Hebrides), and so powerful that it can strangle any swimmer caught in its pincers. However I do not approve of this portrait because it shows all of its feet as pincers, and because its tail contains so many plates.” (*Historia animalium*, IV, 1558, 118)

the other hand, the presence of this engraving, even though immediately signaled as a misrepresentation, foregrounds the fact that the function of illustration is not only “realistic” or “figurative” representation to identification ends. As Sashiko Kusakawa has emphasized in a recent article, the frequent juxtaposition of images presented as correct with others signaled as false seems to be a deliberate choice made by Gessner. He uses it even in the reprints, for instance in *Icones*, keeping a mistaken image together with an engraving meant to rectify the first image:

By juxtaposing ‘true’ and ‘false’ ones, and explaining how the better-known figure was ‘false’, and how it had arisen out of a confusion of names, Gessner lent more credibility to the ‘more accurate’ image. This kind of juxtaposition could thus also function as a form of persuasion.⁹

But we need to go further. The function of persuasion is not incidental, or restricted to these occasional juxtapositions. The 16th-century treatises on natural history are rhetorical works, in which the argumentative approach is

⁹ Kusakawa 2010, 327.

central. I have discussed this aspect elsewhere.¹⁰ For the purposes of our discussion here it is useful to turn to Fuchs who provides a second instance of this strategy, showing the link between text and image from a more relevant and global perspective. The German physician systematically uses legal vocabulary in order to support his demonstrations, in which the descriptive text constantly refers to botanical plates, in order not to illustrate elements that are considered to be mistaken, but in contrast to Gessner's method, to visually incarnate the plant itself.

As we have underlined in regards to the funds containing naturalistic images, a systematic study is irreplaceable. Among current research projects we need to mention the research group working on the relation between text and image from a lexicological point of view under the joint Brest-Bordeaux project "Forms of knowledge" directed by Violaine Giacomotto-Charra and Myriam Marrache-Gouraud. Four one-day conferences have already taken place in both cities, with specific topics that have favored an in-depth reflection on the sum of scientific practices, working namely on the epistemological knot constituted by the relationship text-image in the Renaissance.¹¹

This brings us naturally to a discussion of several aspects of Gessner's texts, and to laying out several possible directions for the better understanding of their thrust.

¹⁰ Glardon 2012.

¹¹ This excerpt from the call for papers reflects the problematic proposed for the series of meetings: "After a first colloquium devoted to the generic names given to knowledge and the ways in which science names itself ('Des noms du savoir et leurs avatars: science, savoir, curiosité, connaissance [...]') Bordeaux, January 2014), the second meeting (Brest, May 2014) tackled the sense of vision and its designations. It was demonstrated that vision, in its practical operation, often needs the assistance of the other senses, and that seeing, far from being an innocuous action, presupposes learning, a method, and awareness. An entire intellectual and scientific apparatus preconditions the act of seeing, conferring it legitimacy. In this sense, observation is not a fortuitous, but a pondered, thought out, voluntary action, engaging a scientific approach which involves the subject. Similarly to other forms of experience, vision presupposes the speech of a subject, which positions him before ancient and contemporary authorities, and founds the truthfulness of his claims according to lived experience. The central importance of vision among other modes of experiencing the world was often underlined during the third meeting (*L'expérience et ses mots*, Bordeaux, October 2014). The assertion of an individual view grounding certain knowledge of the world still remains a subject that needs to be developed. These initial encounters have opened numerous perspectives, and have foregrounded the need to continue the work started. A closer study of the specific lexical field of vision has appeared to be necessary: seeing, as a gesture of appropriation and comprehension of the world is an action of seeking out, which constitutes a central stage both of scientific thought and of the construction of scientific discourse [...]."

IV. Ordering of the species, *accessiones*, *appendices* and *paralipomena*: spatio-temporal extensions of Gessner's treatises

Fig. 3. *Icones avium*, 1555, p. 127

Fig. 4. *Nomenclator aquatiliū animantium*, 1560, p. 53

Fig. 5. *Id.*, p. 274 (fragment)

Fig. 6. *Historia animalium* IV, 1558, p. 1244

Fig. 7. *Id.*, p. 1203

Gessner's prefaces, where he states his ambitions to present all forms of knowledge on animals, are well known. The *Historiae animalium*, which present the species in alphabetical order, claim a form of exhaustiveness which aims at this objective: the animals from alpha to omega, or rather, in the Latin order, from a to z. Yet, a number of elements disrupt the idea of an accomplished enterprise whose results would be contained within the physical boundaries of the works. Thus, I would like to suggest several directions of thought on the *Historiae*, whose insufficient study we have mentioned earlier.

We know that the alphabetic notices are interspersed with classificatory indications that can be distinguished in two categories. First, there are the

textual notes, in the form of lists of species grouped under the same “genre” in the Aristotelian sense (fig. 3–4). Second, there are synoptic tables of varying length, where the species are brought together or separated into subgroups, and where Gessner introduces curly brackets, forming tables with one or two entries that can be read respectively from left to right, and in the case of the double entry, from right to left to present the *divisio* or the *distinctio* between groups of close species (fig. 5).

These classificatory indications are dictated by the necessities of zoology, but also by the need to attribute certain denominations to a single species, or, to the contrary, to different animals. Furthermore, they confirm once again that Gessner never had the intention to limit himself to alphabetical order for the layout of his notices in his works. “Natural” classification is permanently underlying in the *Historiae*. It entirely structures the *Icones*, published as of 1560, as if Gessner wished to offer an obvious counterpoint to the grammatical ordering of the earlier works. On a methodological and epistemological level, at stake is also reiterating by way of synecdoche the harmony inherent in the total sum of beings, which follows the disposition of the “sovereign Architect”, and which could become diffuse or even imperceptible in the abundance of denominations classified in an imperfect, that is to say, too human, manner.

The organization of the material brings forth another cluster of questions, literary this time, that foreground the essential place the textual commentary of ancient works occupies in Gessner’s texts. Aristotle is the author most often mentioned, but other authors keep coming back in the *Historiae*. Who are they? And what is the most adequate presentation of their material? Let us recall as an example the minuteness with which Gessner re-edits Aelian’s *The Nature of animals*.¹² His judgment on the earlier edition of the same work, done by Pierre Gilles, reveals a lot on the methodology used by the Zurich physician:

Pierre Gilles, in his interpretation of Aelian’s animal books, having at once chosen to treat the animals in their reciprocal kinship and, in this profusion, to follow an alphabetic order according to the initials of the names of each animal, has neglected the order chosen by the

12 According to the title in use in the Renaissance. Edition by P. Gilles: *Ex Aeliani Historia per Petrum Gyllium facti, itemque ex Porphyrio, Heliodoro, Oppiano, tum eodem Gyllio luculentis accessionibus aucti libri XVI De vi et natura animalium. Ejusdem Gyllii Liber unus, De Gallicis et Latinis nominibus piscium*, Lyon, apud Seb. Gryphum, 1533. Gessner’s edition: *Claudii Aeliani Praenestini Pontificis et Sophistae, qui Romae sub Imperatore Antonino Pio vixit, Meliglosus aut Meliphthongus ab orationis suavitate cognominatus, opera, quae extant, omnia, Graece Latineque e regione, uti versa hac pagina commemorantur: partim nunc primum edita, partim multo quam antehac emendatiora in utra lingua, cura et opera Conradi Gesneri Tigurini*, Zurich, apud Gesneros fratres, 1556. For an introduction and illuminating comment on Aelian, see the beautiful recent edition by Arnaud Zucker: *De la personnalité des animaux*, Paris 2001–2002, 2 vol.

author, and what is more, has not even followed his own with consistency. Indeed, he has often strayed from the alphabetical order, and has not distinguished the species from the different genres. There was no reason to change the author's ordering, especially given that in the preface to his work the latter notes that he hasn't had to sacrifice any fixed structure for the sake of variety and pleasantness [of writing]. In fact, he [Aelian] has often brought together issues common to two or more animals, either in the same chapter or in adjacent ones, not so much according to their genre as by reason of their nature, quality or some point in common. All this Gilles has brought to pieces, while at the same time he aims to assemble all the information that concerns a particular animal, taking it here and there from Aelian's text.¹³

Here emerges a subject in its own right, namely that of the textual and meta-textual organization of Gessner's work. For Gessner it seems clear that the input of the ancients, albeit essential, is variable and of unequal quality, and that only a scrupulous and respectful approach can bring out its essence. Here again the task of the researchers is enormous and only a collective enterprise could outline its foundations: the evaluation of Gessner's editorial work and his use of sources is a considerable enterprise. It would start with *Historia plantarum*¹⁴ in 1541, stretch over the sizable *Historiae animalium* and extend to the still not very well known compilations on the minerals.¹⁵ Here we touch on a subject that is way more extensive, and significant for the understanding of the intellectual landscape of the Renaissance – namely the history of literary commentary.

The second textual component in Gessner's work that I would like to discuss briefly is the various adjuncts to the already huge *Historiae animalium* and to the *Icones* that followed them: the *Paralipomena*, *Accessiones* and other *Additiones*¹⁶ are far from insignificant, as well as the long errata – annexes

13 "Petrus Gillius Gallus in sua Aeliani librorum de animalibus interpretatione, de cum cognatis inter se animalibus simulagere, et in multis ordinem literarum, quae nominibus singulorum initiales sunt, observare instituisse, non modo authoris ordinem neglexit, sed ne suum quidem persecutus est constanter. Nam et a serie literarum saepe discessit, et animantes diversorum generum non discrevit. Nihil autem necesse erat authoris ordinem immutari cum ipse in operis peroratione varietatis et jucunditatis gratia certum a se ordinem nullum esse institutum profiteatur. Interim tamen saepe quae duobus aut pluribus communia sunt animalibus, vel eodem in capite vel proximis conjunxit, non tam generis animalium, quam naturae et ingenii vel quomodocunque argumenti communis habitatione. Haec Gillius divulsit, dum ea quae ad unum pertinent animal, sparsim ab Aeliano tradita, in unum locum conatur" (*Claudii Aeliani Praenestini [...], opera, quae extant, omnia, 'De Petri Gillii interpretatione [...]' (f. a 3 r°)*).

14 *Historia plantarum et vires ex Dioscoride, Paulo Aeginete, Theophrasto, Plinio, et recentioribus Graecis, juxta elementorum ordinem*, Bâle, apud Robertum Wynter, 1541.

15 *De rerum fossilium, lapidum et gemmarum maxime figuris et similitudinibus liber [...]*, Zurich, 1565, and the work that one might qualify as complementary, *De omni rerum fossilium genere, gemmis lapidibus, metallis et huiusmodi libri aliquot [...]*, Zurich, excudebat J. Gesnerus, 1565.

16 In Gessner, we find the *Accessiones* at the end of the *Icones*, for instance pp. 129–137 (pagination error: 236–237 instead of 136–137) of the *Icones avium omnium*. The lexicographic

that, one would presume, could only complement a work that is already coherent and structured. In what follows I will try to show that, to the contrary, these complementary pieces are an integral part of the works' architecture. Not only do they bring quantitatively a significant amount of information, but they also function as an extension or even amplification of the work. It is enough to observe them more closely to notice this. The examination starts with an inventory of their form and content, of which I will give here only a brief survey.

Regarding their form, it appears that far from being hastily inserted at the end of the work, the *paralipomena* are highlighted in various manners: introduced by an impressively sized title, they are given the same layout as the rest of the work, and are richly illustrated by quality engravings. In *Historia I*, the *Paralipomena* go from p. 1097 to p. 1104. They include 9 engravings of variable size, among which a magnificent ibex and a skin of genet. Some are framed in black and none is included in the body of the text, which denotes a hasty layout. The one of the fallow deer (p. 1100) is signaled as an omission "in historia eus". The genet skin was noticed at the leather merchants' ("apud pellices spectatur"), and the badger engraving has the simple caption "Melis seu Taxi delineatio". At any rate, the general rule is to present additional engravings as received later on and to mention their sender. The one of the *Tragelaphus* for instance is sent by Georgius Fabricius whose long commentary on this species of *cervus* is quoted by Gessner, accompanied by a quote from Georg Agricola and by Gessner's own commentary. In the same line of thoughts, Gessner cites a long letter from Nicolas Gerbelius, who describes the horn of the unicorn preserved in the church treasury of Strasbourg. "I have preferred," writes Gessner, "to include this answer to one of my letters in the *paralipomena* rather than to omit it". (p. 1103).¹⁷ Between page 1105 (not numbered) and page 1113, one finally finds the *castigationes* and the *annotationes*, nine pages filled with corrections and commentaries in two columns, introduced by an eloquent explanation: philology knows no limits.¹⁸

analysis of the titles of these annexes would be interesting in itself. Do we find indifferently the same elements in all of them? What is the history and the development of these terms? In his edition of Aelian's *Animals' personality* Pierre Gilles for instance composes as of 1533 *accessiones* that follow the translations and are proper notices of natural history where he provides philological explanations, but also personal observations.

17 Another example of a letter quoted in its entirety and presented as such in appendix is the long *Epistola Guilielmus Turnerus, anglus medicus* dated November 1557 which concerns the tens of modern and ancient denominations of *aquatilia* (*Historia animalium* IV, 1558, pp. 1294–1297).

18 "Aliae additiones et castigationes pleraeque omnes circa philologiam, cujus fines tam late patent, ut nunquam non aliquid adjici possit." After having written that he would limit himself to the part that contributes to animal history, Gessner explains further how he presents the errata, mentioning only the corrected passages such as they should be read: "annotavi-

Once again these are more than simple corrections, and certain elaborations exceed twenty lines.¹⁹

As we can see, these additions call for an attentive examination, and deliver copious information. In fact, it seems that Gessner was trying to abolish the physical boundaries of printed books, to remove the boundaries between different forms of naturalistic discourse. The scope, the typography, the illustrations, the layout, everything is set to show the reader that the work is continuously ongoing in all its aspects: research, exchanges, with new engravings being ordered permanently. For instance the *paralipomena* of the second volume of the *Historiae* are presented under the form of a separate work, with a frontispiece, tending towards an autonomous form as a volume.²⁰

If we take a larger perspective and consider Gessner's project in its entirety and in its development, it would be wise to follow the content and the volume of the additions: Does their content change? Do they have the same relationship to the main volume? Do they amplify? Or to the contrary, are they reduced in the re-editions? This latter fact could indicate a slowing down of the dynamics in the exploration of the facts of nature, even a tendency to sclerosis of natural history in the 17th century, which had heavily drawn on the writings of the previous century. But these conjectures would need research which goes beyond the scope of the present study. Nonetheless, during Gessner's lifetime and towards the end of the 16th century, another evolution seems to have taken place: it appears that increasingly the emphasis is brought on the curiosities, rarities and exotic species, possibly marking a tendency towards the court zoology that preceded the creation of menageries and the *Wunderkammer*, the famous curious chambers. In his dedication to Hans Steiger of the appendix to the second volume of the *Historiae*, Gessner states that he presents only the most remarkable elements ("singula aliquando animalia perigrina", "cornua egregia et raritate sua pretiosa"). In 1605, an entire volume in its own right is devoted to the creatures originating from afar, which can be considered as an appendix to the works of its prede-

mus autem saepius non quid depravatum, autem omisum sit, sed simpliciter quomodo legendum" (105).

19 Another example, the *Paralipomena* from volume IV of the *Historiae* treating the *aquatilia* are especially voluminous, no doubt due to the great number of scholars interested in fish and other water animals. These *Paralipomena* stretch over 33 pages densely filled with corrections and additions referring to the pages and lines where the reader needs to insert them, containing long explanations and engravings in all possible formats (1258–1291).

20 *The first frontispiece introduces the additions: Historiae animalium liber II. de quadrupedibus oviparis. Adjunctae sunt etiam novae aliquot figurae, in primo libro de quadrupedibus viviparis desideratae, cum descriptionibus plerorumque brevissimis: item oviparorum quorundam appendix.* The appendix has the following title: *Appendix historiae quadrupedum viviparorum et oviparorum*, Zurich, Froschauer, 1554.

cessors such as *Exoticorum libri decem* by Charles de l' Escluse (Carolus Clusius), himself a close acquaintance to Rondelet and editor of a work by Pierre Belon.²¹ Thus the principle of accumulated additions goes beyond the limits of individual works and the individual personalities of the naturalists physicians.

In any case, during Gessner's lifetime one can talk about a methodology and even an esthetics of the unfinished: each notice, whether it is included in a main work or in an addition, is a piece of a three-dimensional puzzle where commentaries and informations overlap in a system reminding of Russian dolls. As a whole, this approach has its own metaphorical value: depicting, in the artistic sense of the word, the infinite richness of the world and its complexity both through image and text. The profusion of data is in itself a rhetorical technique – copia – perfectly suited to convey the idea of natural abundance.

With this in mind, shouldn't we consider the *Icones* not as afterthoughts, pretexts to bring to profit costly plates, but rather as an integral part of the entire work, exceeding by far the limits of the edited volumes? We have already seen their role in the representation of natural order in contrast with the alphabetical ordering of the subject matter.

Fig. 8. *Icones avium omnium*, 1560, 74, Zentralbibliothek, Zurich, NNN 44,2

Fig. 9. *Icones avium omnium*, 1560, Frontispiece, Zentralbibliothek, Zurich, NNN 44,2

²¹ *Exoticorum libri decem, quibus Animalium, Plantarum, Aromatum, aliorumque peregrinorum fructuum historiae describuntur. Item Petri Belonii Observationes, eodem Carolo Clusio interprete*, [Anvers], ex Officina Plantiniana Raphelengii, 1605.

Fig. 10. *Icones avium omnium*, 1560, p. 77, Zentralbibliothek, Zurich, NNN 44,2

A quick examination of two copies of the *Icones* preserved at the Zurich Central Library provides several directions for thought. The two volumes are classified respectively under the reference NNN 44,2 (*Icones avium omnium*, 1560) and NNN 44,3 (*Nomenclator aquatiliū animantium*, 1560). These two volumes are annotated by Gessner in person.²² We are going to have a closer look at the first one, more generously annotated. The additions contained in it are of several kinds:

- corrections of errors and typos (fig. 8)
- formal additions, such as the one figuring on the frontispiece and introducing a correction rubrics appended to the end of the volume devoted to quadrupeds, and a catalogue of Gessner's correspondent friends, sent by Aldrivandi and received in August 1562 (fig. 9). This is the latest date mentioned in this copy. It provides a *terminus post quem* for the period during which Gessner had worked on these corrections, introducing them regularly after the publication of the *Icones*.
- complementary notes communicated by correspondents after the publication of the *Icones*, to be added to specific rubrics. We find the name of John Kay (Caius, 1510–1573), mentioned three times in relation to a letter received in July 1561 (p. 39 and 73, certainly the same letter) and to the sending of a foot of *Haliaetus* received also in 1561 (p. 129).
- complementary notes following an attentive reading of the *Histoire des oyseaux* by Pierre Belon, which could not have been done earlier.²³
- references to other passages or to volume III of the *Historiae*.

²² The *Nomenclator aquatiliū* contains several corrections and rare comments, which nonetheless allow us to identify their author: “Io. Caius ad me misit” p. 13, “ad me scribit Bello-nius”, p. 36, “ut a Io. Dalechampio medico accepi”, p. 75, etc. (Bibliothèque électronique Suisse: www.e-rara.ch/zuz/content/pageview/527810). The copy of the *Icones avium* (<http://www.e-rara.ch/zuz/content/titleinfo/528197>) was brought to my attention by Baudouin van den Abeele, whom I thank here.

²³ We remind that volume III of the *Historiae* devoted to birds appears the same year as Be-lon's work in 1555.

- an annotation relative to an incoherence between Belon's engraving of the bee-eater (*Merops*) and its caption. Gessner, always careful about the coherence between text and illustration, notes that the description mentions fingers opposed two by two as in woodpeckers, while the engraving shows a bird with schematic feet, with just one finger at the back as in most birds.
- the addition of marginal indications to paragraphs, in a long notice where Dalechamps, Pline and a rubric called "nomen" regarding Oppien's denominations are mentioned.
- some long elaborations of more than ten lines which look like new complete notes, for instance on *Quequerdula* (garganey, p. 77, fig. 10) or *Ardea* (grey heron, p. 117, cut leaves).

It is hard to tell whether Gessner's attention had shifted in priority to this form of knowledge in the field of natural history, focused more on the plates and on the relationship between species and their denomination, at the expense of the huge *Historiae* where erudition plays an essential part. Evidence points rather to the contrary. The textual knowledge employed in the latter works is present throughout, conserving their authority as evidenced in the references made to them in subsequent decades. It seems more relevant to underline the care Gessner devotes to his second generation of works as a logical and natural prolongation of his thought. The more recent works follow in a line that reaches far beyond them, just as correspondence continues to flow in the Zurich pharmacy, echoing through the works. Earlier we quoted the sending of a foot of *Haliaetus* by John Kay. This is in fact a discussion, pursued first with written arguments appearing on the same page of the printed text of the *Icones*, then with material ones, bearing on the particular "scales" of the claws of the osprey, mentioned already by Belon.

From a technical point of view, the annotations show that this is not a personal copy, but a volume intended for the printer. The writing is in the language of the edition – one would imagine personal notes to be written rather in German – it is highly legible, and above all the information is presented in a way ready to use, according to the code and in a style that shows no difference from the one of the *appendices* already added in preceding printings.²⁴ Finally, the variations in the intensity of ink, the size of the calligraphy and the placing of notes such as the dates of reception of parcels attest not for a single rereading, but for a continuous correction work with frequent reprisals when new information was acquired. It is obvious that the work, at once cumulative and editorial, was continued with perseverance.

²⁴ We need to add a rare note concerning a modification of the layout in the copy of the *Nomenclator*: the second engraving on page 93 is marked by a brace and the note "ad sequendam pag[inam]".

VI. Conclusion

Having presented several recent developments, we have surveyed some possible directions for investigation, though far from being exhaustive. This modest survey highlights the need for a systematic approach, for thorough examination and in-depth catalogue inventories, lexical studies of the entire body of work, and taking into account the correspondence, the collected objects, the albums with images and all the manuscript documents in the hand of Gessner. The latter, although inventoried and preserved with care, are still very little investigated.

We have highlighted also the positive aspects of the projects already started, uniting successfully medievalists, philologists, science historians, Hellenists, Latinists and art historians. The risk with such multidisciplinary encounters however is that once the conference past, the scholars come back to working within their respective fields. Concretely, propitious frameworks need to be found: the subject matter that still needs to be explored is sufficient for several multidisciplinary thesis topics. The University of Leiden provides a good example. Paul J. Smith from the University of Leiden is supervising an ambitious project sponsored by the Netherlands Organisation for Scientific Research (NWO) entitled *A New History of Fishes. A long-term approach to fishes in science and culture, 1550–1880*, whose structure and scope could bring appreciable developments in Gessner studies. As the title indicates, the project stretches over an extended period, which, although maybe too long, has the advantage of allowing for a diachronic approach, while examining a restricted corpus – the history of ichthyology – whose components stretch over important cultural, scientific and iconographic aspects of natural history. The project includes the contribution of three doctoral students and two post-doc researchers (*Enlightened Fish Books and Collection Building: Ichthyology in the Netherlands, 1760–1880*), and will end in 2019 or 2020 with a colloquium during which their theses will be defended.

Is Swiss modesty getting in the way of such initiative? That would be a pity. Maybe some national pride, though marked by our characteristic moderation, would not be superfluous in the commemoration of the 500th anniversary of Gessner's birth? Still worse would be the consideration that the concept "Gessner" is no longer viable, to use an expression currently in vogue. Unfortunately, there are precedents. Darwin, whose biology continues to set the standard, absorbs still today all the attention of science historians, almost entirely at the expense of Alexander von Humboldt, a spirit as

brilliant as eclectic, who has preceded the English naturalist in numerous fields, from geology to the scientific exploration of South America. As far as Darwinism is concerned, one needs to highlight the contingencies of the 20th century, which have favored the precedence of Anglo-Saxon science over both the German and French school: let us remind that Lamarck's writings no longer attract any attention either. In the 16th century, is Leonardo da Vinci going to definitively push back Gessner into obscurity?

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- www.gallica.fr, website of the BNF which provides links to digitalized editions by other libraries in France.
- Biodiversity Heritage Library, Association of libraries and institutions. For Gessner: <https://ceb.nlm.nih.gov/proj/flash/gesner/gesner.html>. Facing glossary of scientific terms on each page.
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