
ARTICLES

'MOULT OF THE SERPENS [SIC], THEIR LAYING, THEIR DISSECTION'. AN INTERESTING DOCUMENT FOR THE HISTORY OF EUROPEAN HERPETOLOGY BY GEORG SEGERUS, PHYSICIAN TO THE POLISH KINGS

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GEORG Seger (1629-1678), or Segerus (in its Latin form), was born at Nuremberg and studied medicine at Leipzig, Wittenberg and Koenigsberg. On completing his studies he became tutor to the children of Polish aristocrat Teodor Potocki and he accompanied them on their travels throughout Europe. He spent five years in Copenhagen under the supervision of the illustrious teacher of anatomy Thomas Bartholin (1616-1680). He then proceeded to Basel, where he took his doctor's degree in 1660 with *De Hippocratis Orthodoxia in Doctrina de Nutritione Foetus Humani in Utero*. After holding a medical appointment at Torun (Thorn), where he also taught in the highly regarded local high school, he was appointed medical officer to the city of Gdansk (Danzig) in 1675. He was also court doctor to three Polish kings: Jan Kazimierz, Michal Wisniowiecki and Jan Sobieski. His studies in comparative anatomy were stimulated by the Academia Naturae Curiosorum, of which, however, he was apparently not a member.

Collegium Academia Naturae Curiosorum was created in 1652. Cole (1944) stated 'The researches of the Academy during the seventeenth century cover a sufficiently wide field, and this is their chief and indeed almost sole merit. Of the 104 animal types examined the internal organs of a moderate number only were dissected, and in most of cases the author contents himself with listing the organs

found, which are more or less accurately named, but no figures or adequate descriptions are included. Still less are there many attempts to compare one animal with another. The contribution of the Academy to the fabric of comparative anatomy, therefore, is unimportant, especially when compared with the almost contemporary record of Perrault and his colleagues at Paris, who brought to the task not only greater skill but a more prophetic vision of the speculative aspects of taxonomy. Apart from one mollusc, three crustacea, two arachnids and thirty-six insects the German Academicians were more interested in the vertebrates and their list include the Lamprey and eleven teleosts, three reptiles, sixteen birds and thirty-one mammals are represented [sic]. Muralt was incomparably the leading zootomist, contributing almost half of the total observations published, Seger coming next with eight'.

Segerus published the majority of his work in the journal edited by Bartholin *Epistola Bartholini, Thomae Bartholini epistolarum medicinalium a docti vel ad Doctos scriptarum, centuria I, II, III, IV, Hafniae (1663-1667)*. He wrote numerous papers on anatomy, physiology, pharmacology and comparative anatomy. Parts of these papers were also published in *Miscellanea Academia Naturae Curiosorum* and in the *Collections Académiques* edited by the Académie Royale in Paris. Some of this work was of major importance in the history of

medicine. He is recognised as one of the first to describe cystic fibrosis (Bush, 1995). His work on animal anatomy was often quoted at the time, for example his work on the anatomy of the male Hare, an anatomical description of two Hare foetuses, dissection of an Otter, dissection of a Mole, dissection of two Hedgehogs, the search for the sense of hearing in fish, description of a Musk Deer skin, and anatomy of a female seal. Seeger was also associated with the Gdansk school of anatomy. At the end of the 16th century a new high school was founded in Gdansk and anatomy was taught there from 1658 onward. The fact that Gdansk was a major centre for naturalist collections was of great assistance to Seeger in his work. A large part of the Dresden Saxony Royal Collection of crocodiles and American, African, and Asian snakes was brought here (Eilenburger, 1755) and reflects the great variety and quantity of reptile specimens to be found in Gdansk at the time.

The role of the Gdansk school of anatomy in the history of herpetology is little known. Only the work of Jakob Theodor Klein (1685-1759) and particularly *Tentamen herpetologiae* is well known (Johnson et al, 1984). We do, however, know that other Gdansk naturalists also worked on reptiles and amphibians, e.g. Johannes Philippus Breynius (1680-1764), author of *De Coronis Serpentium*, and Michael Christophorus Hanovius (1695-1773), who commented on Indian snakes (1753) and dedicated one chapter of his *Zoologia Sive de Animalis Regio* (1768) to the subject of reptiles.

Seeger's published work on snakes is his only work in the domain of herpetology. It is true that he wrote a paper on toads, but this must be considered as a curiosum medicum and not as a serious zoological work. In this paper he recounts the story of an apprentice butcher who fell ill after drinking puddle water. On being treated with snake fat he is said to have regurgitated three toads. This type of observation was very common — 'There are many reports of animals such as frogs, toads, eels, lizards and snakes which are

supposed to have lived in the stomach, intestine, urinary bladder, female genital organs and even abscesses. Indeed, it is impossible to resist the conclusion that doctors were much misled by their malingering or hysterical patients who deliberately added various animals to their urine or faeces' (Foster, 1965).

Seeger's work on serpents was first published in Denmark under the title *De Serpente Anatomie Corum Exclusionem Vernationem in Epistola Bartholinii E.N.C Dec 1 Ann. 11*. It was also published in *Miscellanea* in the form of a letter from a Torun doctor to his colleague at Wroclaw, Dr. Philippe Jac Sachs de Lewenhaimb, and was later published in France in the *Collections Académiques*. The fact that it was published three times, and that Seeger was a highly respected scientist known throughout Europe, might lead us to believe that it was a much-quoted work. However, this was not the case. It was in fact cited only very rarely and was quickly forgotten. In the 20th century it was quoted only by his biographers and historians commenting on the Gdansk anatomy school (Loth, 1928; Fedorowicz, 1968). It is not mentioned in the history of herpetology in German speaking areas (Obst, 1996). It is, however, mentioned by F.J. Cole (1944) in his history of comparative anatomy — 'Seeger's paper on the structure of a snake (1670), probably the Grass Snake, *Tropidonotus* [an earlier synonymy of *Natrix*], includes notes on all the more obvious organs without disclosing anything novel or important'. It is difficult to agree with this opinion. From the viewpoint of comparative anatomy, Seeger's work cannot be said to be innovative, but it is nevertheless comparable with the finest work available at the time. Its weakness lies in the lack of illustrations.

His work remains important by virtue of the fact that it describes moult and oviposition of snakes in captivity. It is also very probably the first work to describe the keeping of snakes in captivity for scientific, as opposed to religious, purposes. Seeger was the first to observe the 'moult and oviposition' of serpents in captivity. He went on to

publish his description of this observation. The pioneering character and importance of this publication quickly becomes apparent when we compare it with the most important zoological works of the time, those of Gesner & Wolphius (1621) and Aldrovandi & Bartholomaeus (1640). In *their* works the information concerning the behaviour of snakes, still relatively legendary, generally does not come from direct observation but from bibliographical compilations of classical authors. Seegerus's description is therefore probably the first viable information concerning serpent moulting in the history of herpetology.

Seegerus describes 'Having found near Copenhagen in 1656 a large quantity of serpents of the species known as Aesculapian Snakes, because they are in no way dangerous and are without venom, I took some of them alive and placed them in a basket which I had taken to my study. Initially, for reasons of personal safety I removed their little forked tongue, which they constantly moved, following the popular opinion that by means of it they could inflict normal wounds; but later becoming more courageous I left them this organ as being perfectly harmless. The snakes from which I had removed the tongue remained for three days sad and motionless in the basket filled with soft and moist earth, except if irritated. But once they recovered their former vigour, they soon explored my study fearlessly returning to the basket only in the evening'. This document confirms the existence in Central and Northern Europe of the superstition whereby snakes could inflict mortal wounds with their tongues. Seegerus' attitude indicates his distrust in this belief.

On the subject of moult and oviposition Seegerus writes 'One day I noticed that one of them made great efforts to get in between the basket and the wall against which I had placed the basket. I therefore removed it in order to observe the reason why the serpent sought out such a narrow space. It instantly began to shed its skin, starting with the head. Whereupon I took hold of the skin and helped it. Once the task was completed, the snake retired to its nest for a few days until the new scaly

skin had acquired a suitable consistency. On another occasion I observed that one of the female snakes, having rolled about on the tiles, laid an egg thereon. I immediately took the snake and placed it on a table and with gentle treatment I helped it to lay thirteen eggs. The laying of the eggs lasted approximately one hour and a half as each egg took a half quarter hour, and when I stopped helping the female it took longer to lay the eggs, from which I concluded that it was not indifferent to my assistance, particularly since, in the course of the operation, it never ceased to rub its head gently against my hands as if to stroke'.

It is interesting to speculate on the species of snake described by Seegerus. He uses the name Aesculapian Snake, but the absence of a more precise description makes it impossible to affirm that it really was an *Elaphe longissima* and not a Grass Snake, *Natrix natrix*. It is easy to confuse these two species because juvenile Aesculapian Snakes and Grass Snakes have similar markings, characterised by nuchal collars. It should be pointed out, however, that it was possible at the time to find Aesculapian Snakes in the area of Copenhagen: 'The present continuous range of *E. longissima* is restricted to the southern part of Europe, mainly Italy, the Balkans and the northern part of Greece. In addition, there are smaller, isolated populations further north in Europe (Böhme, 1993). On the Danish island Zealand, three records of *E. longissima* from the last century are available, the most recent from 1863 (Hvass, 1942). These isolated populations, restricted to areas with favourable, warm and dry microclimate, are probably remnants or relics of an earlier continuous distribution' (Ljungar, 1995). Gasc et al. (1997) state: 'Though it is not shown on the map, this species occurred in Denmark before 1900'.

The question remains open as to whether Seegerus was able to distinguish between these two species. The Aesculapian Snake was a great centre of attention at the time because of its role in ancient mythology and history. According to legend, the same species is *Epidaurus serpent*,

believed to have vanquished the plague in Rome under Q. Fabrius and Q. Brutus. According to 19th century Détéville's *Dictionnaire des Sciences Naturelles*, the Aesculapian Snake was 'very common in Italy where they are trained to come when called, to perform tricks of various sorts, which is to say that it is very gentle and adapts easily to man'. It is probable, however, that this snake was then better known in southern Europe than in Germany, Poland or Denmark. One sentence in Segerus' work nevertheless causes us to wonder. When describing the reproductive organs he says 'but I could not state it beyond doubt because I did not have the occasion to open male snakes (...) not being able to return to the place from whence I had brought those I describe'.

He acquired his animals for dissection from various sources: some were gifts from friends, others he bought from fishermen or farmers and yet others he himself found on his explorations. We know that he could easily have bought snakes from apothecaries. Given these circumstances, it is difficult to believe that in Torun he could not have found and recognised the Grass Snake, *Natrix natrix*, which was without doubt a very common species in Pommerania at that time. It is therefore quite possible that his specimens were, in reality, Aesculapian Snakes, *Elaphe longissima*.

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