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Museum Stobaeanum

Baroque science at the margin of academia

Håkan Håkansson

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The Museum Stobaeanum was founded at Lund University, Sweden, in 1735. At the time, Lund was one of Scandinavia's smallest academies, struggling for survival, and the creation of the museum was part of a modernization process intended to bring the curriculum up to a par with other European universities. The result, however, was one of the last classic Wunderkammern *in Europe, reflecting ideals that would be superseded a few years later. This essay attempts to contextualize the founding of the museum by focusing on the influences of the creator, Kilian Stobaeus. Best known as the teacher of Carl Linnaeus, Stobaeus not only introduced empirical natural history to Lund but was also influenced by physico-theological ideas that were gaining popularity in 1730s Scandinavia. By examining Stobaeus' textual sources, it is possible tentatively to explore how old practices and new ideals could coexist and merge within the culture of 'Baroque' science.*

No, he was not impressed. A couple of cramped and gloomy rooms in which moth-eaten animals and shrivelled fish were 'hanging from the ceiling and floating among the dust'; a truly unremarkable collection of insects, consisting of a handful of common bugs and butterflies preserved between small pieces of green glass; minerals and fossils crammed higgledy-piggledy into cupboards containing everything from corals and engraved gemstones to amber rings – 'everything in disorder', he sighed despondently.[1]

When the young Daniel Solander (1733–1782) wrote to his teacher Carl Linnaeus (1707–1778), recounting his visit to the Museum Stobaeanum at Lund University in October 1759, he neither could conceal his contempt nor cared to. Admittedly, Solander told Linnaeus, Erik Gustaf Lidbeck – professor of natural history in Lund, and himself a former student of Linnaeus – had recently compiled an 'extensive catalogue' of the entire collection, listing more than 3,000 specimens and artificial objects. But even though all the specimens had been 'numbered and described', surprisingly few of them had been 'mentioned by their correct names', and the entire collection was in a complete disarray: 'who would believe that such barbarism would taint any of the disciples of the great Linnaeus?' And however carefully Solander scrutinized the jumble of objects, the museum clearly contained 'little to boast of'. Indeed, the only 'rarity' in this travesty of a collection, he sniffed, was a stuffed stork.[2]

To be sure, the sarcasm may not have been entirely deserved, but Solander was known for the sharpness of his pen as well as of his wit, and during his visit to Lund he was in a foul mood. Several months earlier he had caught 'Uppsala fever', possibly a mild form of malaria, and despite taking quinine and spending time at the famous health spa at Ramlösa – oh, so overrated! – he was still not well. Moreover, Solander was a true connoisseur of collections, familiar with the most exclusive natural history cabinets in Sweden. In his late teens he had assisted Linnaeus in arranging and describing the royal collections at Ulriksdal and Drottningholm castles, as well as Count Carl Gustaf Tessin's renowned collection of minerals and fossils. And now, at the age of 26, he was heading for London, where he had been summoned to bring scientific order to 40,000 specimens at the British Museum – a work that eventually landed him a position on James Cook's first voyage around the globe.[3]

And yet, though Solander may have been something of a snob, his reaction when visiting the Museum Stobaeanum is quite understandable. Even to a casual observer it was obvious that the collection was no

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longer in the pristine condition it had once been. A few years earlier the curator had matter-of-factly noted that the stuffed mammals and birds were 'so spoiled by moths that most of the hairs and feathers have fallen off'.[4] But more importantly, the Museum Stobaeanum must have struck Solander as a decidedly old-fashioned, perhaps even outdated, form of collection. Like many naturalists of the mid-eighteenth century, Solander was of the opinion that the physical arrangement of a collection should reflect the hidden, underlying 'order' of the world, an order that, in his view, was best described through Linnaeus' taxonomic system.[5] Even naturalists who strongly objected to Linnaeus' binomial nomenclature often favoured a similar view of the ideal museum. In his *Histoire naturelle*, the Comte de Buffon included a chapter on collecting, arguing that 'the most favourable arrangement for the study of science should be a methodical order that distributes things by classes, genera and species . . . each kingdom having a separate place'.[6] A few years later, Diderot echoed Buffon's views in the most influential Enlightenment publication of all, the *Encyclopédie*, adding that 'the order of a cabinet cannot be that of nature; because nature affects everywhere a sublime disorder . . . But a natural history cabinet is made to teach us; there, we must find in detail and in order those things that the universe presents to us as a whole [*en bloc*].'[7]

When viewed against these new scientific ideals, the Museum Stobaeanum must certainly have come across as something of an atavism, a remnant of superseded ideas and ideals more akin to a Baroque *Wunderkammer* than an Enlightenment collection. From the ceiling dangled stuffed crocodiles and birds of paradise next to a kayak from Greenland and a complete Eskimo outfit. In a corner stood an Egyptian mummy next to a chair made entirely of whale bones. On the shelves were bottled snakes and anatomical curiosities, including 'a monstrous stuffed calf head', a 'dried human foot' and 'a stuffed girl', on display next to works of art and exotic bric-à-brac from around the globe: a pair of Chinese shoes, a snuffbox made from a coconut, a bowl made of pork rind, a miniature spinning wheel of ivory and a 'hat made of roots from the East Indies'.[8]

It is hardly surprising, then, that a scholar of Solander's stripe found the collection strangely outdated and unscientific. More surprising, perhaps, is the fact that the Museum Stobaeanum had been founded just twenty-five years earlier, in 1735, in an attempt to modernize Lund University and to bring the curriculum in step with European scientific development.

Kilian Stobaeus and the creation of the museum

Lund was certainly no Wittenberg or Oxford in the 1730s. Founded by the Swedish Crown in 1666 in territory recently conquered from Denmark, the university was primarily intended as a means to integrate the region culturally with Sweden. However, owing to continued wars between Denmark and Sweden, as well as lack of funding, Lund University had remained a peripheral seat of learning compared to its more prestigious Scandinavian rivals, Uppsala and Copenhagen. By the end of the 1720s, Lund had no more than 400 students, most of them of relatively humble and local origin, and was supervised by a mere handful of professors in a single, two-storied building in dire need of repair.

In the 1730s, however, things slowly began to change. Thanks to the recently appointed chancellor of the university, Count Carl Gyllenborg (1679–1746), the institution was provided with funds for its first chair in the natural sciences, or *philosophia naturalis et physica experimentalis* as the subject was formally called. Gyllenborg also proposed a thorough modernization of the university building and its surroundings, conceived as including a proper botanical garden and an anatomy theatre similar to those found at major universities elsewhere. Although decades would pass before Lund could be said to be on a par with its international models, a number of improvements were made in the 1730s, including the construction of an anatomy theatre and a museum on the upper floor of the university building.

The driving force behind much of this work was the very scholar appointed to the new chair in natural philosophy, Kilian Stobaeus (1690–1742). Today Stobaeus is mainly known as the teacher of the young Carl Linnaeus, who spent a year at Lund University in the late 1720s. As Linnaeus bluntly put it many years later, 'Stobaeus was a sickly man, one-eyed, crippled in one foot, constantly plagued by migraine, hypochondria and backache; but also a remarkable genius.'[9] The 20-year-old Linnaeus formed a strong

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bond with the childless and ailing man, later claiming that Stobaeus had loved him 'not as a pupil, but more like a son'. During his time in Lund, Linnaeus lived in Stobaeus' house, studied in his library and marvelled at his private collection of natural specimens, which contained 'stones, shells, birds and herbaria of dried and mounted plants' – the very collection that Stobaeus eventually donated to the university, thereby founding the Museum Stobaeanum.[10]

Although historiography has often reduced Stobaeus to a footnote in the career of his more renowned pupil, he had quite a reputation in eighteenth-century Scandinavia as an able and influential scholar. Born to a family with close ties to Lund – his father had been the university bursar, his uncle professor of rhetoric and history – he chose a career in medicine and spent some years in Gothenburg as a practising physician. In 1725 he returned to Lund, where he successfully combined an academic career with continuing medical practice. Although his salary as a university teacher was meagre, in time he made a small fortune as personal physician to the local nobility and as manager of the Ramlösa health spa. However, according to one of his students, he also spent much time in his private 'Laboratorium Chemicum', preparing drugs for the 'sick and poor who could not afford to buy their health at the city pharmacy'.[11]

Stobaeus' devotion to medicine may certainly have been fuelled by his own ill health. Blind in one eye and having a severe limp owing to tuberculosis in his hip as a child, he described himself as a 'hobbling and lame man'. In a letter to a friend he claimed that he had hardly ever experienced 'a day of health', as he was constantly plagued by headaches and was unable to walk without 'great agony'; to travel by carriage for a mile caused him 'great pains and torment' throughout his body.[12] Despite his ill health, however, Stobaeus engaged in a remarkably wide array of subjects. As a professor he not only taught natural philosophy and experimental physics but also published papers and dissertations on medicine, palaeontology and even history, his command of which led to his appointment to a second chair in 1732. And in the summers, as he wrote to Gyllenborg, he spent most of his time surrounded by his 'chosen and most curious physices Studiosis', teaching them 'Botanicis and Historia Naturali Curiosa' – subjects, he proudly added, that had never before been taught in Lund.[13]

While Stobaeus' ailments probably prevented him from doing fieldwork himself, his teaching was clearly empirically orientated, rather than merely bookish in character. In 1729 he penned a set of instructions for his students on how to systematically document the nature and cultural life of southern Sweden during an extensive field excursion. Every plant and herb should be collected and described, along with details of where and under what conditions it grew, as well as the name and medical uses attributed to it by country people. In a similar manner the students were to document the wild animals of every region, as well as the location of all lakes, creeks, bogs, springs and caves. Samples of minerals, stones and soils should be systematically collected and described, in particular all *lapides figurati*, fossils and 'remains from the universal deluge' they might come across. The documentation should also include notes on ancient monuments and archaeological remains in the landscape, common folk tales about ghosts, trolls and dwarfs associated with certain locations, and accounts of unusual weather phenomena, such as blood rains, hailstorms and earthquakes.[14]

Needless to say, Stobaeus' plan was much too ambitious ever to be realized, but a large portion of his private collection of *naturalia* was undoubtedly brought together by his students on shorter excursions. Specimens of a more exotic origin were also regularly sent to him by scholars with whom he corresponded, including the German naturalist Johann Heinrich Linck (1674–1734) and the physician Theodor Wilhelm Grothaus in Copenhagen. So, for instance, in 1731 the latter sent him dried plants from the East Indies and shells from the Faroe Islands, as well as an 'arabico-malabaric manuscript'. And from a relative in the Swedish East India Company he received Javanese nuts and some sea urchins, as well as a batch of Chinese paper.[15]

When, in 1735, Stobaeus donated his collection to the university, he had clearly entertained the idea for several years, but had postponed it repeatedly until the university building had been renovated – wisely, one might add, since as late as 1732 the university librarian was still complaining of the leaking roof and broken windows, which allowed 'birds to fly in and soil the books'.[16] By 1735, however, the building had been refurbished and remodelled according to contemporary standards; it now had a brand new anatomy theatre on the upper floor next to the library, as well as

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two additional rooms for a newly acquired collection of mechanical instruments and Stobaeus' 'stock of *Curiosis naturalibus atq. Artificialibus*'.[17] The ambition was clearly to modernize the curriculum in an empirical direction, with a greater emphasis than before on medicine and the natural sciences. Simultaneously, both the anatomy theatre and the collection afforded the university a certain amount of new prestige. As Chancellor Gyllenborg put it in a letter, the Museum Stobaeanum was founded for the 'use and adornment of the academy', suggesting that he regarded the symbolic value of the collection as equal in importance to its educational applications.[18]

Unfortunately, the Museum Stobaeanum ceased to exist as a unified collection in the early nineteenth century, when the individual objects were divided up between various academic departments, and no visual representations of the original museum have survived, apart from a small glimpse offered in the background of the only extant portrait of Kilian Stobaeus (Fig. 1). Painted in 1737 it shows the round-faced scholar, wearing a massive black wig, of a style that had gone out of fashion decades earlier. He is seated inside the museum with a live snake coiling around his finger – an emblem of his medical profession – with some shells, flowers and a fossilized plant on the table beside him, symbolizing the breadth of his scientific interests. Behind him is a fairly realistic representation of the museum he had founded just two years earlier. Suspended from the ceiling hover a stuffed crocodile and a bird of paradise, both classic showpieces of the Baroque *Wunderkammer*, and over his right shoulder we see a cupboard crowned by a large shell sculpture, described by a visitor as 'a mountain of seashells'.[19] On his other side, is a similar artistic creation, succinctly described in the catalogue as 'a cave of stones and mussel shells, whereupon Bacchus stands, made of glass, and inside a Chinese idol'.[20]

Fig. 1. Carl Mörth, portrait of Kilian Stobaeus in his museum, 1737, Lund University Art Collection. Reproduced by permission of Lund University.

Whether the shell compositions depicted in the portrait were works of Stobaeus' own hand is uncertain, as the collection rapidly grew thanks to a number of additional donations in the years following the foundation of the museum. In 1736 Gyllenborg donated an Egyptian mummy, recently smuggled out of Saqqara by Swedish envoys to the Ottoman Empire.[21] Gyllenborg also made sure that Lund received a collection of American artefacts and specimens, collected by the priest of the Swedish congregation in Delaware, Samuel Hesselius (1692–1753).[22] The director of the Swedish East India Company, Colin Campbell (1686–1752), donated a collection of Chinese artefacts and fishes, while Stobaeus' student Johan Leche (1704–1764) assembled a suite of pictures in the style of Giuseppe Arcimboldo (d. 1593), in which the four elements – fire, air, earth and water – were portrayed allegorically by means of carefully arranged natural objects (Fig. 2).[23]

The additions to the collection certainly reinforced the impression of the Museum Stobaeanum as a classic *Wunderkammer*, intended to dazzle and entertain as well as to serve an educational and scientific purpose. It should be noted, however, that even though Stobaeus' original donation was supplemented by gifts from other donors, Stobaeus himself continued to act as curator of the growing collection, which was still formally known as the Museum Stobaeanum, and modelled the arrangement of the objects on well-known collections described in the literature to which he had access. These included the famous collections of Manfredo Settala and Olaus Worm, as well as the royal *Kunstkammern* in Copenhagen and Gottorf, all of

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Fig. 2. Arcimboldesque figures by Johan Leche, *c.*1736, representing (*clockwise from top left*) fire, air, earth and water. Reproduced by permission of Lund University Historical Museum.

which displayed the seventeenth-century predilection for playfully mixing art with nature, entertainment with erudition, the common with the rare and extraordinary.[24] When a young student described a visit to the Museum Stobaeanum in 1741, his attention effortlessly skipped from the stuffed birds and dried insects to a Turkish knife case and a 'transparent fan of some kind of glass'; from a petrified fish tongue to the Egyptian mummy, 'whose head had come off'. Above all, he took care to note down the objects that seemed deliberately to stretch the boundaries between art and nature, between man's and God's handiwork: a carved walnut containing a pair of gloves; various engraved nautilus shells; and, of course, the allegorical tableaux of the four elements, in which the deity of the air was represented entirely by 'feathers and butterflies' and that of the earth by 'seeds and ears of grain'.[25]

Undoubtedly, part of the purpose of the Museum Stobaeanum was to instil a sense of sheer wonder and abundance in the visitor, even at the expense of systematics and order. Yet it is quite clear that, in founding the museum, Stobaeus' primary intention

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was to create a collection that could be used within the university curriculum, in which empirical knowledge of the world could be both produced and visualized for educational purposes. To Stobaeus, however, as to most of his pre-Enlightenment contemporaries, wonder was an integral part of practising science; indeed, one of the fundamental functions and merits of empirical science was its ability to inspire wonder and awe, making man aware of God's wisdom and omnipotence. We shall now take a closer look at how Stobaeus' sources shaped and justified his views of collecting as a scientific practice, and how these views related to the early eighteenth-century Christian culture to which he belonged.

'. . . a model of the universal nature made private'

To characterize the refurbishment of Lund University in 1735 as a 'modernization' might almost seem ironic. After all, the academy Stobaeus tried to create was modelled on a well-established tradition, stretching back to the mid-1500s, when anatomy theatres, botanical gardens and natural history collections became regular features at major European universities.[26] As is well known, this development was intimately dependent on the empirical turn in the natural sciences, signalling a shift from a predominantly literary culture of scholarship to an increasing emphasis on sensual experience as the foundation of scientific knowledge. Equally important, however, was the concept that scientific facts were best established at specially created sites of knowledge production: that is, artificial structures in which nature could be handled, studied, dissected, probed and classified. One of the earliest and best-known expressions of this idea can be found the *Gesta Grayorum* (1594) of Francis Bacon (1561–1626), describing an imaginary research facility containing 'a most perfect and general library', a 'spacious, wonderful garden', various laboratories, as well as 'a goodly huge cabinet', housing artefacts, minerals, fossils and natural specimens of every imaginable kind. Such a facility, Bacon argued, would constitute 'a model of the universal nature made private', making it possible to discover the 'natural causes' of all phenomena.[27] Decades later, Bacon elaborated the idea in his utopian work *New Atlantis* (1627), describing a fictional society completely transformed by the empirical knowledge produced in 'Solomon's House', a massive research facility entirely dedicated to 'the study of the Works and Creatures of God'.[28]

Although Bacon was not the originator of the concept, his visionary portrayal certainly did much to popularize the idea of the all-encompassing research institute, featuring specific spaces in which every aspect of nature could be studied. By the end of the seventeenth century, many of the major scientific academies, such as the Royal Society in London, the Académie Royale in Paris and Istituto delle Scienze in Bologna, explicitly modelled themselves on Bacon's idealized House of Solomon. By that time, most major universities in Europe had already adopted the architectural pattern established in late Renaissance Italy which originally inspired Bacon's vision – namely, an academy comprising several complementary spaces, including library, garden, anatomy theatre and museum collection: in other words, the very design adopted in Stobaeus' refurbishment of Lund University in 1735 (Fig. 3).[29] And though it was by no means customary for scholars explicitly to invoke Bacon, much of the theoretical justification for this type of institution was rooted in the Baconian reform of natural philosophy. As Paula Findlen has observed, the idea of the natural history collection as a space for knowledge production was intimately connected with Bacon's notion of empirical science as a practice that 'privileged human invention and demonstration over pure observation'. Proper science, in Bacon's view, was an 'activity that removed nature *from* nature in order to study it better'.[30]

Of course, in reality most academies did not come close to the all-encompassing scope of Bacon's utopian House of Solomon. Many academies boasted large gardens and collections, but they rarely constituted the true microcosms they claimed to be, for the simple reason that they 'ignored 99.9 percent of [the cosmos] in favor of the singular and the anomalous', as Lorraine Daston has pointedly phrased it.[31] Interestingly, however, Bacon's proposal for a scientific reform also reflected many of the conceptions that shaped and fostered typical Baroque practices of collecting, including the seventeenth-century predilection for marvels and rarities, and the habit of playfully assimilating art to nature. In *The Advancement of Learning* (1605), Bacon suggested that the study of natural history should be pursued along three different paths. The first was to study 'Nature in Course'

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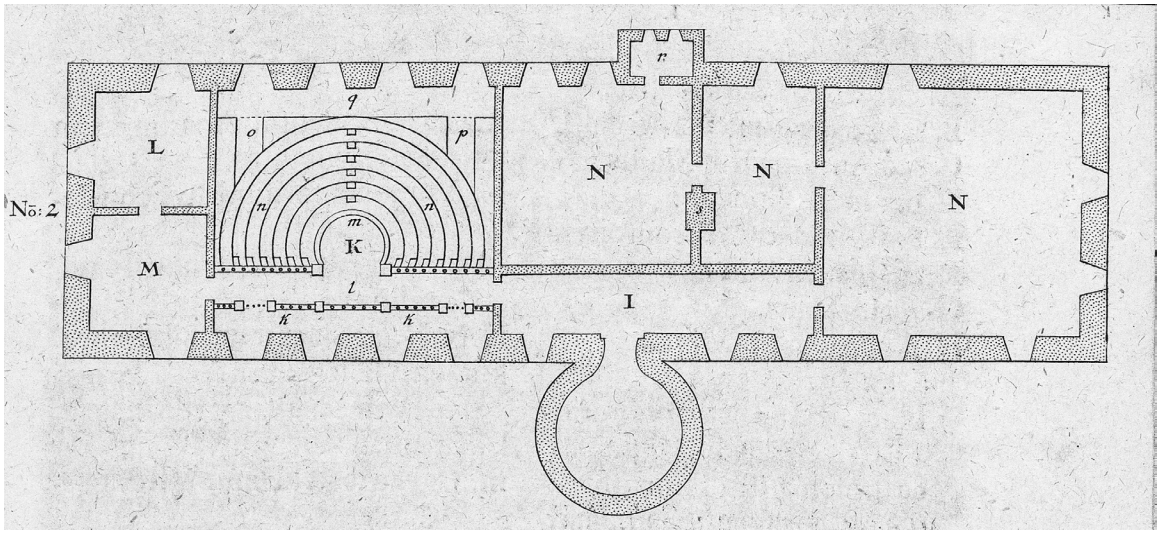

Fig. 3. Plan of the upper floor of the Lund University building, from Christian von Nettelbla, *Schwedische Bibliothec* (1736). The collection was mainly housed in the room marked M, though according to contemporary accounts many objects were also placed in the adjacent anatomy theatre (K) and instrument chamber (L). The library was housed in the three rooms marked N. Reproduced by permission of Lund University Library.

– that is, nature when it follows its everyday, regular laws. Secondly, we should study 'Nature Erring, or Varying', which occurs when nature diverts from its ordinary course and produces monsters, marvels and irregularities. And thirdly, we should study 'Nature Altered or wrought' – the effect of nature 'put in constraint, moulded and made as it were new by art and the hand of man'.

Whereas the first branch of natural history was well known and practised by a host of renowned scholars, Bacon claimed that little attention had been given to the second branch, the study of marvels, which required a 'substantiall and severe Collection of the Heteroclites or Irregulars of nature, well examined and described'.[32] Indeed, according to Bacon, the study of 'prodigies and monstrous births of nature; of everything in short that is in nature new, rare, and unusual' was essential precisely because such phenomena 'correct the erroneous impressions suggested to the understanding by ordinary phenomena'.[33] In other words, he believed that the true order of nature became most evident when it deviated from its ordinary course.

Moreover, according to Bacon, the study of natural marvels was also essential to the pursuit of the third branch of natural history, 'nature made new by art and the hand of man'. What Bacon referred to was primarily the mechanical arts, imitating and sometimes transcending the ordinary workings of nature. But, as he pointed out, art and nature were most closely related at their extremes, when producing their most ingenious and wonderful phenomena: 'it is an easy passage from miracles of nature to miracles of art'.'[34]

In insisting that nature and art – in the sense of technology and crafts – belonged to the same realm, Bacon expressed a notion that remained common throughout the seventeenth century. As the English physician Henry Power remarked in 1664, art was but 'the Imitation of Nature (or, Nature at Second-Hand)'. This not only implied that 'the works of the one, must prove the most reasonable discoveries of the other', he noted, but that 'all things are Artificial; for Nature it self is nothing else but the Art of God'.[35]

And yet the relation of art to nature was anything but uncomplicated in the seventeenth century, as is testified by the very scientific spaces in which their affinity was most manifestly displayed, the Baroque *Wunderkammern*. As Lorraine Daston has put it, seventeenth-century collections were often arranged as a 'deliberate hodgepodgery', [36]in that the objects were chosen and juxtaposed to maximize the impression of cornucopia-like abundance and to erase the distinction between art and nature. The catalogues

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describing the collections, on the other hand, were often scrupulously organized, carefully distinguishing between *naturalia* and *artificialia*, a fact that often forced writers to describe the same object in several different contexts. In the *Museum Wormianum* (1655), for instance, the Danish scholar Olaus Worm (1588–1654) first described a cup made of rhinoceros horn as a natural specimen, focusing on the origin of the material and its characteristics, only to return to the object later in the section of *artificialia*, describing it as a rare and exquisite object of art.[37]

Of course, the difficulty encountered in categorizing hybrid objects was precisely the quality that evoked such wonder in early modern culture, making items like engraved seashells, sculpted coconuts and gilded corals exceedingly popular in Baroque cabinets of curiosities. But it also reveals an ambiguity of status between art and nature, which quite often fostered overt tension and competition between the two realms: art certainly imitated nature, but it also modified, improved and perfected nature. In 1599 the Italian apothecary Ferrante Imperato (*c.*1525–1615) proudly remarked that some of the stones and minerals in his collection of *naturalia* had been 'brought to perfection by art' – in other words, by being engraved and polished by man they had become the natural objects of art they in some sense were meant to be.[38] And in his account of the royal collections in Copenhagen, the Danish naturalist Holger Jacobaeus (1650–1701) included a long poem entitled 'Art talks to nature', in which art argues for her superiority over nature precisely because of her ability to improve and perfect what nature brings forth: 'I am everywhere like you, if not greater than you, nature of things'.[39]

Thus, many of the stylistic traits of the seventeenth-century *Wunderkammer* formed an integral part of the new empirical philosophy that was rising to prominence in the latter part of the century. Often described as 'Baroque' in character – a slightly, and sometimes deliberately, derogatory term – the awe-inspiring hodgepodgery of the *Wunderkammer* has often been interpreted as a reflection of aesthetic tastes and fashions outside the boundaries of 'science proper'. But to some extent, at least, the *Wunderkammer* reflected beliefs and ideals that were intrinsic to the new scientific world view, and would remain so until the Enlightenment transformed science into something quite different.

Indeed, in recent years a number of historians have suggested that the term 'Baroque science' could be applied to a particular brand of science, characteristic of the seventeenth and early eighteenth centuries. Rather than being a transitional phase between the old and the new, between the 'bookish' culture of medieval scholarship and the systematic empiricism of the Enlightenment, 'Baroque science' was a different kind of science, having its own set of practices, ideals and problems. In particular, Ofer Gal and Raz Chen-Morris have argued that 'Baroque science' was characterized by inherent tensions and frictions between partly contradictory ideals and practices, some of which can be seen reflected in the *Wunderkammer* tradition. So, for instance, they highlight the tension inherent in seventeenth-century empiricism itself. On the one hand, it was based on the simple notion that knowledge is acquired by sensory experience. On the other, there was a growing reliance on artificial instruments, such as microscopes and mechanical devices, for experimentation, used in artificial spaces, such as laboratories and natural history collections, which essentially isolated nature from its original environment, implying that knowledge was essentially mediated and constructed rather than a product of direct and immediate sense perception. Likewise, the relation of nature to art was highly contested among seventeenth-century scientists, precisely because nature itself could be perceived as a work of art – that is, as a creation of God. As a consequence, the boundaries between nature and human culture often tended to blur – as seen, for example, in the *Wunderkammern* – while simultaneously investing the study of nature with a deeply emotional element. As God's creation, nature was not meant only to be understood and mastered: more than anything, it had been created as an inexhaustible source of religious wonder and awe.[40]

The following sections will examine some of the textual sources on which Stobaeus relied, and will discuss how they may have shaped his views of the natural sciences, and of collecting as a scientific as well as a religiously edifying practice.

The textual sources of Stobaeus' collecting practice

It should be emphasized that the direct influence of Bacon on early modern collecting – including Stobaeus' views on collecting – was fairly limited. To

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be sure, Stobaeus had a copy of Bacon's *Opera* in his personal library, and Baconian philosophy was well known and widely admired by Scandinavian scholars in the early eighteenth century. When Mårten Triewald (1691–1747) held public lectures on experimental philosophy in Stockholm in 1728 – the very year that Stobaeus was granted a chair in natural and experimental philosophy at Lund – he praised Bacon as the greatest of scientific reformers and the originator of the new natural philosophy.[41] Even the renowned theologian Andreas Rydelius (1671–1738), who was generally regarded as the most influential of Stobaeus' colleagues at Lund University, highlighted Bacon as the founder of modern science in a widely popular work of 'essential readings' for students.[42] The philosophy of Bacon, however, was not a manual detailing the what and how of collecting: rather, Bacon's work provided a philosophical framework that legitimized many of the conventional practices of early modern collecting, including the taste for marvels and monsters, the juxtaposition of art and nature, and the idea of the museum as an artificially constructed space for knowledge production.

The actual what and how of collecting, on the other hand – what to collect and how to display it – were to a large extent based on praxis and convention rather than articulated principles. Texts explicitly discussing why certain types of objects were considered collectables and why certain forms of display were considered suitable were exceedingly rare, leaving most scholars to rely on catalogues and descriptions of existing collections when forming their own, if they were not in the position to visit some of the famous collections of Europe in person. As already noted, Stobaeus' ill health made it impossible for him to travel and there is no indication that he even visited nearby Copenhagen and its famous royal *Kunstkammer*. He did, however, have access to a number of printed works that clearly influenced his views of collecting. In the catalogue of his private library we find works describing the late sixteenth-century collection of Ferrante Imperato, as well as the seventeenth-century collections of Michael Rupert Besler (1607–1661) and Manfredo Settala (1600–1680). He also owned the lavishly illustrated catalogues of the royal museum in Copenhagen and Duke Frederick III's collection at Schloss Gottorf, both founded in the early 1650s. Somewhat surprisingly, he did not own a copy of Worm's *Museum Wormianum* (1655), but according to the library records he borrowed the book from the university library in the late autumn of 1734, when the construction of Museum Stobaeanum most probably began.[43]

Given Stobaeus' knowledge of these textual sources, it is hardly surprising that the Museum Stobaeanum reflected many of the stylistic traits of the seventeenth-century *Wunderkammer*. For instance, the Arcimboldesque images made by his student Johan Leche were probably inspired by works in Stobaeus' library, as similar figures are depicted in both Besler's *Gazophylacium* and Adam Olearius' account of the Gottorf *Kunstkammer*.[44] Another work that seems to have been important to Stobaeus was *Museum museorum*, published in three massive volumes in 1704–14, by the German physician Michael Bernhard Valentini (1657–1729). Linnaeus later noted that he was privately educated in natural history by Stobaeus in his home, using Valentini's work and Stobaeus' own collection of 'curiosities'.[45] Unlike the other texts on collecting in Stobaeus' library, Valentini's work was not intended as a detailed catalogue of a specific collection: instead, it may be described as an encyclopedic retrospective of the entire *Wunderkammer* tradition, dedicating more than 1,500 folio pages to describing the contents of virtually every major collection in Europe, many of which were no longer extant when the book was published. Stobaeus' interest in Valentini's work was probably stimulated by the detailed accounts of rare *naturalia* it presented, not least minerals and fossils in collections that he had not encountered in other sources. But it also provided a vivid picture of the varied and idiosyncratic taste of early modern collectors, spanning the luxurious objects of the sixteenth-century royal collections to the seemingly common specimens of the early eighteenth-century naturalists; from the 'shoes made of human skin' kept in Leiden to the curious egg owned by Mayor Lorentzen in Leipzig, 'in which a picture of a sun can be seen, and which was hatched by a hen in 1666 when a comet was seen in the heavens'.[46]

An interesting aspect of the work is that Valentini to a large extent relied upon textual sources rather than personal visits or recent eyewitness accounts when describing the collections. As a consequence, his work tended to present the collections as contemporary institutions, even when they had long since been dispersed or rearranged – a tendency that effectively telescoped the historical perspective and effaced

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any traces of historical change in the practices of collecting. In this, Valentini's work – much like Stobaeus' physical museum – can be characterized as a product of 'Baroque science', in which the past and the present, tradition and renewal, often coexisted and blended, despite their inherent tensions and differences.

More important, perhaps, is the fact that Valentini's work was one of the few examples of the genre – and certainly the only one in Stobaeus' library – to include a theoretical discussion about collecting, explicitly addressing the motivations and justifications for creating, maintaining and arranging collections. The section entitled 'Unvorgreiffliches Bedencken von Kunst- und Naturalien-Kammern insgemein' was, in fact, written by the German physician Johann Daniel Major (1636–1693) and had originally been published in 1674. As Valentini noted in his introduction, Major's 'unassailable' ('unworgreifflichen') tract was now hard to come by, which was why he had taken the trouble to reprint the entire text as an appendix to his own work.[47]

Interestingly, Major was fairly critical of the traditional *Wunderkammer* and its disorganized character, arguing for a more purposeful ordering of the cabinet. As Vera Keller recently put it, Major aimed at professionalizing the *Wunderkammer* by turning it into a 'philosophically organized research collection', rather than an object of prestige for people of wealth and power.[48] Most collections, Major noted, arranged the objects in a way that disregarded the intrinsic order of nature, whether by putting them on display alphabetically or even completely haphazardly: 'an armadillo next to an ostrich egg, a coconut next to a petrified mushroom, a bird of paradise next to a *remora* fish'. Instead, he suggested that natural objects should be arranged 'methodically', each object put neatly on display according to size – 'like organ pipes' – within their respective class and category.[49] Hybrid objects that fitted into several different categories should be kept separate from the *naturalia* and described in different cross-referring catalogues, in which all their properties, both natural and artificial, were properly accounted for.[50]

This way of arranging a collection required an intimate knowledge of natural philosophy, Major noted, which prompted him to suggest that only a scholar well versed in modern 'physical–mathematical experimental studies' had the necessary skills to achieve it – a view that should have resonated with Stobaeus, recently appointed professor of natural philosophy and experimental physics.[51] And yet, there is no indication that Stobaeus took any of Major's advice into consideration when creating the Museum Stobaeanum. Whether this was a deliberate choice or not is impossible to say, but it does serve as a reminder that long-standing practices often prevail in the face of new ideals. Despite Valentini's explicit endorsement, Major's novel recommendations were effectively drowned out by the plethora of real collections presented in Valentini's work, most of them relying on the time-worn practices of the traditional *Wunderkammer*.

Religion and science: collections in the service of faith

It would be a grave mistake to interpret Major's views as forming a precursor to a modern approach to natural history collections. Major's text is significant not only in that it situates collecting in a scientific context, but also in that it brings into the foreground the historical and religious context of early modern collecting. Major introduced his text by asserting that man's desire to understand nature had a divine origin; it was an inborn urge, shared by all human beings, which had been implanted by God in 'the first philosopher', Adam, at the dawn of time. The natural sciences, in effect, were as old as mankind and had been practised by the very first man in the Garden of Eden. As such, science was not a human invention, nor was the study of nature an end in itself; rather, the natural sciences had been founded by 'a higher and godlike power' for the purpose, as Major put it, of honoring the 'wisdom and wonders of God'.[52]

Major's views of the roots of science were by no means original, but echoed notions that were commonplace throughout the early modern era. Nor was it uncommon to emphasize the religiously edifying purpose of the natural sciences. In the words of Ann Blair, one of the major differences between early modern science – or 'natural philosophy', as it was commonly known – and its modern successors is that it 'was unified by its search for a better understanding of God – of divine creation (in natural historical disciplines) and divine laws (in the mathematized disciplines)'.[53] This close relation between religion and science was repeatedly emphasized by Major, who noted that

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man had access to two sources of true knowledge, the 'Word of God' – that is, the Bible – and nature, both of which had been brought forth by God, and both of which were means to gain a better understanding of his wisdom. Indeed, in the first sections of his work, Major suggested that by studying nature man would ultimately be able to repair the damage caused by Adam and Eve's rebellion against God. Invoking the biblical narrative of the Fall and man's subsequent banishment from Paradise, Major described how Adam had originally been created as a consummate image of God, having a perfect understanding of the world and its workings. Owing to the Fall, however, 'the table of his brain' ('der Taffel seines Gehirns') had lost its original clarity and his mind had been wiped clean, as Major evocatively described it. From that moment, man had been left to acquire knowledge of the world by relying on 'sound reason founded on experience' – that is, by practising empirical science – in the hope that humankind would one day reclaim what had been lost at the dawn of time.[54]

As Major pointed out, however, gaining knowledge of nature in its entirety required a collection of truly universal proportions, in which literally everything in nature, 'from sea and land, from above as well as below ground, and even from foreign places', had been brought together 'in the flesh' to be seen and examined – a vision strikingly similar to Bacon's fictional House of Solomon, of which Major may very well have been aware.[55] But, according to Major, only two such consummate collections had ever existed in the world: the collections of the biblical kings Solomon and Hezekiah, both of which he described in detail, on the basis of a careful – if slightly forced – reading of a variety of texts from the Bible, the Apocrypha and early Christian authorities.[56]

References to Solomon and Hezekiah were by no means uncommon in early modern texts on collecting. As early as 1565, Samuel Quiccheberg suggested that the treasure-houses of Solomon and Hezekiah could be viewed as ideal models for contemporary collections.[57] Similarly, Valentini praised Solomon as having been the first to create a natural history collection 'to make God's omnipotence and wisdom shine even more clearly'. Indeed, Valentini even suggested that the legendary knowledge of Solomon – the philosopher–king who had 'wisdom and understanding beyond measure, and breadth of mind like the sand on the seashore', as the Bible stated – was a direct result of his extensive collections, which enabled him to fathom the secrets of the whole world.[58]

To what extent Kilian Stobaeus shared Major's and Valentini's views is uncertain, as he never explicitly discussed the theoretical foundations and history of collecting in any of his texts. To be sure, Major's account echoed many notions that were common among scholars from the Renaissance well into the eighteenth century. Among these was the idea of an 'ancient wisdom' or *prisca philosophia*, the notion that the natural sciences traced their origin to Adam, who had been granted a total knowledge of the world, later lost, or at least compromised, at the Fall. In many versions of this narrative, remnants of the Adamic wisdom were said to have been preserved by the biblical sages – most notably Moses and Solomon – who had later passed it on to their descendants, from whom it eventually reached the Greek philosophers.[59]

The notion of an ancient wisdom had an immense impact on early modern scholarship, shaping the ideas of many natural philosophers who are often perceived (though quite erroneously) as precursors of modern science. Bacon's call for an empirical 'instauration of the sciences' seems to have been rooted in a quite literal understanding of the concept of *instauratio*, a renewal, a restoration, a revival of the wisdom lost to man at the dawn of time.[60] Similarly, in 1694 Isaac Newton prepared a new edition of his *Principia*, revised to demonstrate that his mathematical philosophy was in agreement with 'the most ancient philosophy' of the Egyptians.[61] And even Worm, who introduced his *Museum Wormianum* by belittling the 'empty subtleties' ('ineptas argutias') of the medieval scholastics and praising the recent progress of the empirical sciences, was convinced that this apparent progress was actually a return to a more original philosophy, pre-dating the Greeks and even the biblical patriarchs. In his inaugural lecture as professor of natural philosophy at Copenhagen university, Worm vividly argued that God had granted Adam all the secrets of the natural sciences in the Garden of Eden, secrets that had later been handed down from generation to generation, from Moses and Solomon to the Egyptians and the Greek philosophers.[62]

The notion of an ancient wisdom thus had an important role in early modern scientific culture, not only in strengthening the ties between religion and science but also by legitimizing empirical and experimental science as a method of inquiry in the service of

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Christian faith. In 1667 the clergyman Thomas Sprat (1635–1713) praised the forming of the Royal Society and the Baconian philosophy on which it was based, stressing both the practical uses of science and its religiously edifying function. Experimental and empirical science, he claimed, would teach us 'to *Worship* that *Wisdom*, by which all things are so easily sustain'd' and lead us 'to admire the wonderful contrivance of the *Creation*'. Indeed, science 'was the first service, that *Adam* perform'd to his *Creator*, when he obey'd him in mustring, and naming, and looking into the *Nature* of all the *Creatures*. This had bin [*sic*] the only *religion*, if men had continued innocent in *Paradise*, and had not wanted a *redemption*.'[63] According to Bishop Sprat, empirical science was not only in harmony with Christian faith and religion: it was the first and original religion.

The influence of physico-theology

Although Stobaeus did not discuss the idea of an ancient wisdom in any of his texts, he expressed a deep commitment to the idea of the natural sciences as religiously edifying disciplines, ultimately aimed at supporting Christian faith and religion. In his dissertation *De nummulo Brattensburgensi* (1732), for instance, he emphasized that human knowledge of nature may always be limited, yet we are obliged to 'admire and worship the wisdom, holiness and justice of our Creator, visible even in the smallest and most common of things we daily walk among'. Similarly, in a dissertation on fossilized wood, he stressed that such specimens should not be understood merely as products of natural processes; they also constituted 'divine monuments', expressing the 'omnipotence, wisdom and justice of God', and were thus meant to be 'contemplated' much like the pyramids, obelisks and columns of the ancients.[64]

Needless to say, the notion that the natural sciences served a religious purpose had been a commonplace since the early Middle Ages, often supported by references to biblical passages such as Romans 1:20: 'For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made'. Medieval scholars, however, had most often been keen to emphasize the disciplinary distinctions between natural science and theology, stressing that even if science served as the 'handmaiden' of theology by supporting the doctrines of faith, natural science could not, in and by itself, give us knowledge of the divine. In the latter half of the seventeenth century, however, these disciplinary distinctions tended to blur, not least among scholars advocating an empirical and experimental approach to natural science.[65] Robert Boyle (1627–1691), whose work was known to Stobaeus, described the objects of nature as 'the steganography of God's omniscient hand', and the practice of science as a 'philosophical worship of God'.[66] In a similar vein, the botanist and clergyman John Ray (1627–1705), another naturalist with whom Stobaeus was familiar, argued that the empirical study of nature revealed the wisdom of God, implying that scientific studies should be included in the prescribed duties of the Sabbath, just like attending church: after all, the Sabbath had been 'instituted for a commemoration of the Works of the Creation'.[67]

Unsurprisingly, early modern collections were often described in similar terms, as instruments in the service of faith as well as of science. The German scholar Adam Olearius (1599–1671) introduced his account of the Gottorf *Kunstkammer*, a work well known to Stobaeus, by claiming that the collection was a means of reading God's divine word as it was manifested in 'the great wonder book of the world', a book whose 'two vast pages' – the heavens and the earth – revealed the 'majesty and omnipotence of the Creator'.[68] Similarly, visitors to the cabinet of the Amsterdam merchant Jan Volkertsz (1578–1651) described his collection of curiosities as 'a book in which God has gloriously described himself', written in 'letters that enable us to contemplate God's invisible things'.[69]

It remains a common idea – at least in popular culture – that the natural sciences lost much of their religious connotation by the end of the seventeenth century, but, in fact, science remained deeply embedded in a religious setting throughout most of the eighteenth century. Indeed, as Rienk Vermij has pointed out, there 'was probably no period in history in which religious contemplation was more closely linked to the study of nature than the eighteenth century'.[70] Above all, the late 1600s had seen the emergence of a new scholarly genre known as 'physico-theology', a religiously motivated form of science, explicitly aimed at scientifically demonstrating the wisdom and omnipotence of God by empirical and experimental studies of nature. Superficially, physico-theology had its basis

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in the commonplace assumption that the order and beauty of nature proved the existence of an intelligent maker. As the term suggests, however, physico-theologians deliberately blurred the disciplinary boundaries between theology and natural philosophy, fusing science and religion in a previously unprecedented way.[71]

The introduction of the term 'physico-theology' is generally traced to Walter Charleton's *The Darkness of Atheism Dispelled by the Light of Nature* of 1652, subtitled 'a physico-theologicall treatise'. As a discipline, however, physico-theology relied more heavily on late seventeenth-century natural scientists such as Boyle, Ray and Jan Swammerdam (1637–1680), all of whom had emphasized the importance of systematic empiricism as well as the religiously edifying function of natural philosophy. In his *Historia insectorum* (1669), a work owned by Stobaeus, Swammerdam praised the recent progress of microscopic studies, which were revealing a hitherto unknown world, more complex than any man could have imagined, and thereby filling us 'with sentiments of admiration and reverence for the great Author of nature'.[72]

Physico-theology became increasingly influential in the first decades of the eighteenth century, generating a host of publications and gaining a wide audience in England, Germany, France and Scandinavia. Part of the impetus behind the emergence of the genre was a heightened fear of atheism and deism in the early eighteenth century – a fear that, paradoxically, had largely been fostered by the very scientific developments invoked by physico-theologians in defence of Christian faith. In the humanities the emergence of textual criticism had made it all too clear that a strictly literal understanding of the biblical text was incompatible with empirical evidence, a realization that was gradually beginning to erode the authority of the Bible. So, for example, it had been shown that the biblical chronology was contradicted by a wealth of historical sources, indicating that both the earth and human culture were much older than the Bible implied. Similar conclusions could be drawn from recent geological findings, whereas an increasing emphasis on the predictability and regularity of natural laws in the physical sciences, as exemplified by Newtonian physics, provoked a growing fear of deism – the idea of a completely passive Creator, who does not intervene actively in the world.

Although the threat of atheism and deism was more perceived than real in early modern culture, physico-theology was essentially a reaction to these growing concerns. In the first systematic work in the genre, *Het regt gebruik der wereltbeschouwingen* (1715; 'The true use of world concepts'), the Dutch scientist Bernard Nieuwentijt (1654–1718) explicitly addressed the dangers of atheism and deism and invoked Boyle's experimental philosophy as a means to reassert the validity of Christian faith. Just like Boyle, Nieuwentijt viewed experimental and empirical science as a philosophy fully in accord with biblical revelation. A large part of his massive book (which was reprinted in at least six editions and swiftly translated into English, French and German) was devoted to demonstrating the parallels between recent results in the natural sciences and the study of biblical revelation, thereby demonstrating the divine origin of the Bible. Thus, according to Nieuwentijt, the natural sciences did not simply affirm biblical authority: by demonstrating 'the great Creator's wonderful and inscrutable wisdom', they also fostered true faith in the 'steady and immobile foundations of His Holy Word', making us susceptible to 'the wonders of divine grace'.[73] Science, in effect, brought us salvation.

Physico-theology certainly no longer holds any credence – and rightly so, one might add – yet it would be deeply unfair to label eighteenth-century physico-theologians 'pseudo-scientists'. While their theological conjectures may not have been supported by empirical facts, the scientific basis of their work was a systematic, objective and quantified analysis of empirical data, which, in the words of Miklós Vassányi, 'met (or even set) the highest standards of unprejudiced, professional natural philosophy'.[74] It is hardly surprising, then, that the genre was to influence many of the foremost empirical scientists of the era, including Scandinavian scholars like Stobaeus. Indeed, Stobaeus owned virtually all the major works in the field available at the time, from those of Bernard Nieuwentijt to Friedrich Christian Lesser (1692–1754), Johann Jakob Scheuchzer (1672–1733), René-Antoine Ferchault de Réaumur (1683–1757), Noël-Antoine Pluche (1688–1761) and Christian Wolff (1679–1754).[75] Nor is it surprising that physico-theology influenced early eighteenth-century practices of collecting. In 1734 the Dutch pharmacist Albertus Seba (1666–1736), whose collection of *naturalia* was among the best-known in Europe, invoked a host of physico-theologians when

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arguing for the religiously and morally edifying character of a natural history collection.[76] Likewise, the Dutch physician Frederik Ruysch (1638–1731) stated that he had arranged his collection of anatomical specimens 'for the contemplation of the wondrous works of God Almighty', whereas the Amsterdam merchant Levinus Vincent (1658–1727) claimed to have made his vast collections available to the public in order to strengthen the Christian faith of his visitors.[77]

Fossils: reasserting biblical authority by science

The influence of physico-theology on Stobaeus' views is most evident in his works on palaeontology, a subject to which he devoted a number of dissertations and which clearly lay at the centre of his collecting interests. In 1732 Linnaeus noted that Stobaeus' collection of stones and minerals consisted primarily of fossils, and it seems to have been the only part of his private collection that Stobaeus ever took the time to catalogue in a systematic way.[78]

Indeed, it is quite possible that Stobaeus was drawn to palaeontology precisely because in physico-theological literature an exceedingly important role was attributed to fossils. As a response to the growing critique of biblical literalism in the late seventeenth century, many physico-theologians focused on the biblical account of the Flood and its relevance to our understanding of fossils. Until the mid-seventeenth century, fossils were commonly understood as *lusus naturae*, or 'sports of nature', produced by inorganic processes in the earth. In the latter half of the century, however, scholars like Nicolas Steno (1638–1686), John Ray and Robert Hooke (1635–1703) challenged this view, arguing that fossils were the remains of organic life forms, embedded in the earth during the biblical deluge, as portrayed in Genesis 6–9. In the early eighteenth century, the theory of a diluvial origin of fossils – or 'diluvianism', as it would later be known – gradually gained recognition; by the time Stobaeus composed his dissertations, diluvianism was, if not uncontested, at least widely accepted among Scandinavian scientists.[79]

The diluvial theory of fossils rested, to a large extent, on recent empirical findings, but its wide acceptance was also motivated by the fact that it formed a close link between the geological sciences and the biblical account of the creation. When Steno argued in 1669 for the organic origin of fossils, his ambition was not merely to demonstrate how the geological evidence disproved the commonplace notion of *lusus naturae*: he also – and primarily – attempted to show how natural-historical evidence and the scriptural account of the Flood supported and reinforced each other, thereby reasserting biblical authority by means of empirical science.[80] Similarly, in his *Three Physico-Theological Discourses* (1693) – another work well known to Stobaeus – John Ray argued for a diluvial origin of fossils on both scientific and theological grounds, claiming that the idea of fossils as mere 'sports of nature' was contrary to the Christian notion that God had created everything for a specific end and purpose. To claim that nature itself could produce images of plants or animals in the earth, he wrote, was simply to 'put a Weapon into the Atheist's Hands'.[81]

The single most important work for making diluvianism generally accepted among early modern naturalists, however, was probably the *Essay toward a Natural History of the Earth* (1695) of John Woodward (1665–1728), professor of physic at Gresham College. In this work, Woodward presented a wealth of geological evidence supporting the idea of fossils as the remains of the biblical deluge – 'the most horrible and portentous Catastrophe that Nature ever yet saw', he wrote, when 'an elegant, orderly, and habitable Earth' was 'shattered all to pieces, and turned into an heap of ruins'.[82] In Woodward's view, it was obvious that such a cataclysmic event was not caused by natural processes, even though the effects of the Flood – including the formation of fossils – could be described as purely natural. Rather, the deluge was literally a miraculous event, caused by divine intervention and brought about 'with the Assistance of a Supernatural Power', a notion that made Woodward's text influential among physico-theologians striving to contest deistic ideas of a passive Creator. As Woodward himself emphasized, his overall ambition was not merely to present a theory of geological processes, but to 'assert the Superintendence and Agency of Providence in the Natural World' and prove 'the Fidelity and Exactness of the Mosaick Narrative of the Creation and of the Deluge'.[83]

Stobaeus was most certainly familiar with these theories by the time he published his first short papers on palaeontology in 1730–31. In 1732 he published his first dissertation on the subject, *De nummulo*

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Brattensburgensi, in which he was able to identify the so-called 'Brattenburg coins', believed in local tradition to be calcified ancient coins, as fossils of craniate brachiopods, nowadays considered to belong to the genus Isocrania. Stobaeus' approach in these publications was strictly empirical, relying on both comparative studies and practical experiments, including calcination and the boiling of fossil samples in nitric acid, to prove the organic origin of fossils. Regarding the diluvial origin of fossils, however, he was decidedly vague in these early publications, effectively evading the question of the biblical Flood and its possible role in the formation of fossils.[84] But by the time he wrote his last and most comprehensive dissertation, the *Monumenta diluvii universali* ('Testimonies of the universal deluge') in 1741, Stobaeus clearly favoured the more modern view of fossils. Drawing on a wide range of authors, from Steno, Ray and Woodward to the recent publications of Friedrich Christian Lesser and Johann Jakob Scheuchzer, Stobaeus argued that fossils were undoubtedly a product of the 'Mosaic cataclysm' described in the Bible.[85]

Stobaeus' reliance on the German scholar Lesser is worth noting, not only because Lesser was one of Stobaeus' most frequently quoted sources, but also because he made the religious dimensions of palaeontology exceedingly clear. In the introduction to his 1,300-page work *Lithotheologie, das ist: natürliche Historie und geistliche Betrachtung derer Steine* (1735; 'Theology of stones, that is, a natural history and spiritual contemplation of stones'), Lesser claimed that the natural world constituted a 'Catechism that teaches us the first letters of a knowledge of God'. By studying all the 'wonders of God' – in particular, stones, minerals and fossils – man would 'know and praise the goodness of God'.[86] Like most physico-theologians, Lesser not only regarded empirical natural history as a devotional practice, ultimately aimed at man's spiritual salvation, but also argued forcefully against the deist conception of a passive Creator, stressing that 'God is no mere spectator in nature, who allows everything simply to take its course'. Rather, God took an active part in everything, governing the universe as well as man's everyday life by means of the very natural laws he had created, including punishing the 'godless' with rain, hail, thunderstorms and diseases whenever he deemed it fit.[87] This was precisely why Lesser attributed to the Flood such an important role in his account of the formation of fossils: as remnants of the biblical deluge they constituted physical evidence of God's active and punishing power. Fossils, he wrote, were nothing but 'testimonies of His wrath ['*Monumenta* seines Zornes'], which He has inscribed in stone'.[88]

It should be emphasized, however, that Stobaeus did not make the religious implications of diluvianism nearly as explicit as did Lesser. Nor did most of his Swedish contemporaries who shared his views on the formation of fossils, including internationally renowned scholars such as Urban Hiärne (1641–1724) and Emanuel Swedenborg (1688–1772), as well as Stobaeus' close friend Magnus von Bromell (1679–1731), all of whom had argued for the diluvial origin of fossils several years earlier than Stobaeus. Even when the influence of physico-theology is evident in their writings, they most often refrained from using the overtly devotional style and terminology of the genre, favouring a clearly descriptive and explanatory mode of writing. Magnus von Bromell, for instance – whom Stobaeus had known since his youth and with whom he regularly exchanged specimens – argued quite dispassionately that fossils were a product of 'the great universal Deluge', but restricted all references to the religious implications of this view to the dedicatory poem that introduces the work. Referring to Luke 19:40, in which Christ claims that even 'the stones will cry out' in praise of the Lord, Bromell wrote:

> these stones are the ones of which God has said,
> . . . they shall cry out when all is quiet, and praise the power of the Lord,
> no stone exists that does not reveal the hand of God,
> the greatest art and the greatest wonder shines through in earth and sand.[89]

A similar stylistic difference can be found between Stobaeus' writings and the physico-theological sources he relied on, making it difficult to assess the extent to which he embraced their devotional view of natural history. This is perhaps most evident in the case of the Swiss natural philosopher Johann Jakob Scheuchzer, to whom Stobaeus referred more often than to any other and whose texts seems to have exerted an exceptional influence on his palaeontological views. Scheuchzer was a prolific writer, whose interests ranged from the natural sciences and palaeontology to biblical history, subjects he also deliberately strove to combine in a number of his works. Today he is perhaps best known for his *Homo diluvii testis* (1726; 'Evidence of a diluvian human'), a short dissertation

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in which he presented a new-found fossil of a human being drowned in the biblical Flood, a finding modern palaeontologists are more inclined to interpret as a fossilized salamander. In early eighteenth-century scholarship, however, Scheuchzer's name was respected and his views were exceedingly influential. Scheuchzer himself was heavily influenced by the diluvial theory of Woodward, whose work he translated into Latin in 1704, thereby making sure that it gained international recognition.[90]

In his various works, Scheuchzer adopted Woodward's physico-theological perspective on nature, constantly emphasizing the wisdom of the Creator and the religiously edifying function of the natural sciences. Scientific knowledge, Scheuchzer claimed, constituted a form of 'natural theology' and the practice of science a kind of 'natural worship of God' ('natürliche Gottesdienst').[91] Like many physico-theologians, Scheuchzer also attributed to the biblical Flood a key role in the history of the world, not only as a cataclysmic event that literally transformed the shape of the earth, but also as a true 'miracle'. Although Scheuchzer often stressed the regularity of natural laws – 'God is a God of order', as he put it – he insisted that the Flood was a result of direct divine intervention. The biblical deluge was not merely 'a work of nature' ('ein Natur-Werck'), but quite literally a 'wonder' ('Wunder'), caused by God's active interference in human affairs.[92] And this was why palaeontology became so central to Scheuchzer's scientific enterprise: fossils provided tangible evidence linking God's two books – nature and the Bible – to each other, proving that both were speaking the very same language of truth. As Scheuchzer was fond of putting it, fossils constituted 'tokens of remembrance' ('Gedenckzeichen'), reminding us of the Flood and God's punishment of humankind's moral depravity. As such, they were not merely geological proofs of the Flood; they were, as Michael Kempe phrases it, 'sermons in stone', a notion implying that the natural historian in some sense must be 'a preacher of nature'.[93]

Stobaeus' interest in Scheuchzer's work is far from surprising, since Scheuchzer had established himself as a major European authority on palaeontology by the time Stobaeus produced his first essays on the subject. In the 1730s Scheuchzer also became increasingly recognized in Scandinavia as a physico-theological writer. In 1741, the very year Stobaeus published his *Monumenta diluvii universali*, his respected colleague at Lund University, the theologian Andreas Rydelius, recommended Scheuchzer's writings along with Nieuwentijt's for all students who wanted to 'behold God's finger in nature' and know 'the wisdom, power and goodness of the great God'.[94]

The work to which Rydelius explicitly referred was Scheuchzer's monumental *Physica sacra*, or 'Holy natural science, in which all the natural phenomena occurring in the Holy Scriptures are clearly explained and proved'. Published in 1731–5, in four huge folio volumes, containing more than 750 full-page copperplate engravings, the *Physica sacra* was Scheuchzer's magnum opus, in which he tried to prove definitively that the biblical record was in full agreement with modern science – not only the biblical account of the deluge, but the Bible in its entirety. As Scheuchzer wrote in an advertisement for the work, most scholars of the Bible had no knowledge of the natural sciences, which forced them to lapse into 'mystical and allegorical explanations' and nonsensical 'word dabbling' ('Wörter-Fischerey').[95] Instead, Scheuchzer proposed to analyse systematically virtually every biblical passage describing natural phenomena and processes, and demonstrate how they conformed to modern scientific findings. So, for instance, in response to the biblical claim that Adam had been formed in God's image from the dust of the earth, Scheuchzer gave a concise account of modern embryology, intended to show that the authors of the Bible had been able to express their deep, scientific knowledge of this subject in simple layman's terms (Fig. 4).[96] Ultimately, Scheuchzer's aim was to demonstrate how the biblical text, containing scientific knowledge not known to man at the time it was written down, could have been produced only with the assistance of divine illumination, thereby reasserting the divine authority of the Bible while simultaneously legitimizing science as a Christian vocation.

Again, it is difficult to ascertain whether Stobaeus shared these views unreservedly, as his references to Scheuchzer tend to be quite specific and restricted to the subject of palaeontology. He did, however, spend a considerable sum on acquiring a copy of the *Physica sacra* through a subscription; indeed, at 25 *dalers* – twenty times the cost of a good pair of shoes – the four-volume set was by far the most expensive work in Stobaeus' entire book collection.[97] He also repeatedly referred to the *Physica sacra* in his *Monumenta*

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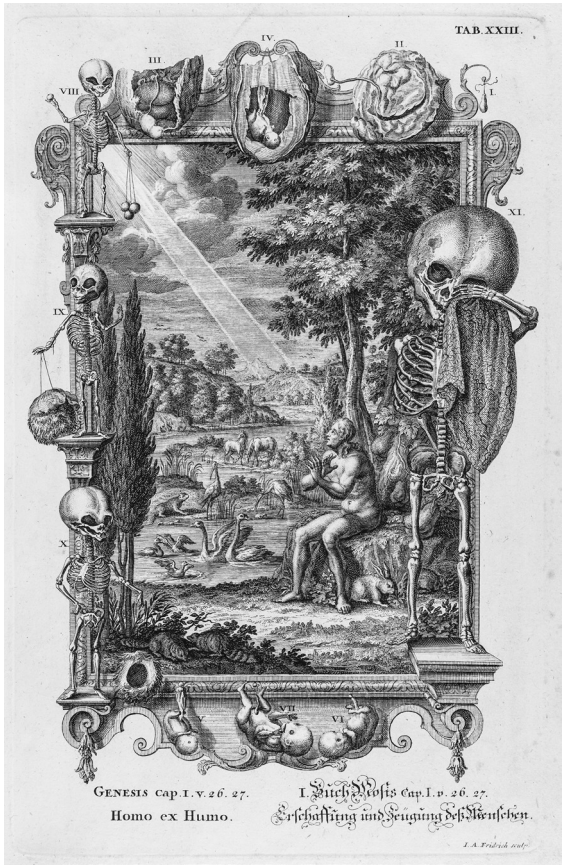

Fig. 4. J. J. Scheuchzer, *Physica sacra* (1731–5), vol. I, pl. 23, commenting on the biblical account of Adam's creation. Reproduced by permission of Lund University Library.

diluvii universali, including an appreciative note on Scheuchzer's discovery of a fossilized human being from the time of the Flood. Observing that remarkably few human remains from the deluge had been found, Stobaeus was eager to emphasize the importance of Scheuchzer's recent discovery, which formed a centrepiece of the *Physica sacra* and its argumentation.[98]

In fact, it is quite possible that the title of Stobaeus' dissertation on the Flood was directly derived from the *Physica sacra*. As Irmgard Müsch has noted, the very last engraving in Scheuchzer's work was intended as a programmatic epilogue or summary of the entire work and its underlying ambition. Captioned *Monumentum Diluvianum* ('Testimony of the Flood'), the plate shows a block of slate from Scheuchzer's own 'Cabinet of the Flood' ('Sündfluth-Cabinet'), as he called his collection of fossils. On the slate can be seen a row of strange markings, clearly made of fossils but remarkably reminiscent of Hebrew characters (Fig. 5). Scheuchzer readily admitted his inability to decipher the odd 'Characteres' or 'hieroglyphica', choosing instead to present them to his fellow scholars as a 'riddle' ('Räthsel') to be solved. But even if he could not grasp the meaning of the letters, he wrote, they most certainly proved the existence of an 'Author' ('Urheber') behind the message, one who had inscribed this riddle in stone as a 'memorial of the old Flood', to make man wonder at the wisdom and power of God.[99]

In essence, Scheuchzer voiced the same sentiments as those expressed by Stobaeus in one of his dissertations – namely, that even if the natural sciences had not yet provided explanations for everything, they

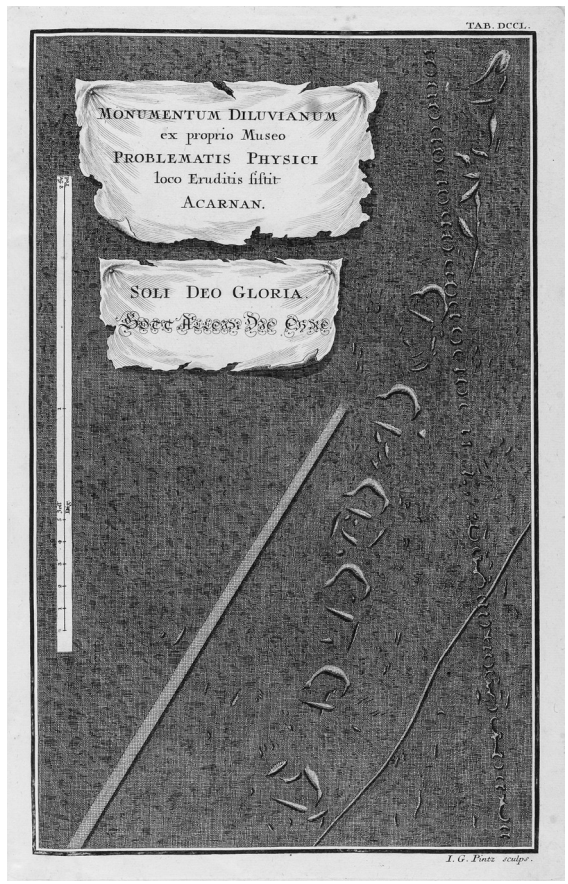

Fig. 5. J. J. Scheuchzer, *Physica sacra* (1731–5), vol. IV, pl. 750, captioned 'Monumentum Diluvianum' ('Testimony of the Flood'). Reproduced by permission of Lund University Library.

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still served the purpose of making us wonder at the wisdom of God. 'We humans are forced to acknowledge our ignorance and instead admire and worship the wisdom, holiness and justice of our Creator, visible even in the smallest and most common of things.' Or as Scheuchzer phrased it at the very end of the *Physica sacra*, summarizing the aim of the holy natural science: 'Gott Allein Die Ehre', 'Glory to God alone.'[100]

The Museum Stobaeanum as Baroque science?

When Daniel Solander visited the Museum Stobaeanum in 1759 he made no effort to conceal his contempt. And, indeed, it is hard to deny that what Stobaeus had created, at the very threshold of the Enlightenment era, was a museum representing everything that Enlightenment naturalists would mock and deride just a few years later. Yet it would be deeply unfair to characterize Stobaeus as an isolated traditionalist, out of step with his time. To be sure, Lund was at the periphery of academia and Stobaeus' ill health effectively tied him to the small country town. The longest journey he ever made was to Gothenburg in his twenties, and there is no indication that he even visited Copenhagen, just 40 kilometers away across the Sound. Despite this, however, Stobaeus kept in touch with the latest scientific trends and findings: he regularly corresponded with colleagues in Sweden and abroad, exchanging opinions, discoveries and specimens; he subscribed to a number of newspapers from the European mainland, which kept him updated on matters of the world; and, aided by the bookseller Johan Christian Rothe in Copenhagen, he acquired a steady stream of scientific publications from the major printing houses of Europe.[101]

Like many pre-Enlightenment adherents of empirical and experimental philosophy, however, Stobaeus also struggled to make the reality of research conform with scientific ideals. When writing his instructions to his students on collecting and documenting specimens of virtually everything in the neighbouring landscape – plants, animals, minerals, even historical monuments and oral traditions – he clearly envisioned a systematic mapping of the world much too detailed and all-inclusive to be feasible. If his museum was ever intended to reflect these empirical ideals, the result was a reflection heavily distorted by both tradition and omission. But perhaps it would be fair to question whether this ever was truly his intention. The strained coexistence of long-prevailing practices and new ideals, of respected traditions and calls for regeneration, was a common feature of late seventeenth- and early eighteenth-century collections. Some decades earlier, Nehemiah Grew (1641–1712) introduced his catalogue of the collections of the Royal Society – the institution that most explicitly adopted Baconian philosophy – by claiming that 'not only Things strange and rare, but the most known and common among us' should be collected in the name of science. And yet his catalogue paints a picture of a collection remarkable similar to a traditional *Wunderkammer*, displaying all the expected rarities of a seventeenth-century cabinet of curiosities, from the Egyptian mummy and stuffed armadillo to the misshaped foetuses and 'the Skin of a Moor . . . tanned with the Hair of the Head, and even the smallest in all the other parts remaining on it'.[102]

As previously mentioned, it may be helpful to use the tentative term 'Baroque science' to characterize the scientific culture of the era, not least to remind us that the practices of late seventeenth- and early eighteenth-century scientists should not – and cannot – be judged by modern or Enlightenment standards. The empirical and experimental philosophy they practised was not an immature or less sophisticated version of what science would later become, but a different creature altogether, having different motivations, different methods and different aims. Indeed, the apparent friction between the time-worn practices of collecting – focusing on rarities – and the new scientific ideals – promoting a more systematic and inclusive approach to nature – may have been much less overt to late seventeenth- and early eighteenth-century natural philosophers than it appears to us, simply because a main purpose of science itself was to inspire wonder.

This emotional element was a central feature of the empirical and experimental philosophy that was gaining influence in the seventeenth century and forming an intimate link between the natural sciences and the realm of faith. For even if the pursuit of knowledge may have been a uniquely human passion, the emotion itself – that is, man's inborn desire to know about the world, as well as the wonder evoked by knowing about it – was perceived not as human in

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origin but as divine. As we have seen, this was a point zealously made clear by Johann Daniel Major in his tract on collecting: that man's desire to understand nature was a divine gift, implanted in us to make us wonder at the wisdom of God.

The notion that man's ability to wonder was a gift of God – a commonplace echoed by theologians throughout the early modern era – also formed the basis of physico-theology, which rose to prominence among European scientists and collectors in the early eighteenth century. As we have seen, Stobaeus was clearly influenced by this genre, even if his academic texts tended to be less explicitly devotional in tone than many of the sources he relied on. How these stylistic differences should be interpreted is uncertain. It is clearly possible that Stobaeus' restrained style was due to personal preferences, signalling that he found the contemplative and religious aspects of the natural sciences less significant than did many of his European contemporaries. But it is equally possible that it was a deliberate choice to respect disciplinary boundaries in the context of an academic dissertation, which was a traditionally strict form of publication and may have been deemed ill suited to devotional exposés in the context of natural philosophy. If this was the case, however, it was an attitude that would change dramatically as physico-theology gained momentum among Swedish intellectuals towards the latter half of the 1730s. In 1736 William Derham's *Physico-theology* (1713) appeared in Swedish translation and the physico-theology of Christian Wolff became increasingly fashionable in academic circles, gradually making a mark on the academic curriculum. Towards the end of the 1740s, the devotional style of physico-theology was sufficiently accepted to appear in an academic dissertation on natural history, written, as it happened, by Stobaeus' former student Carl Linnaeus.

Linnaeus' adherence to physico-theology is evident in many if not all of his works, but few express his religious reverence for nature as lyrically as his dissertation *De curiositate naturali* (1748; 'On curiosity about nature'). In this text he presented all the basic assumptions and tenets of physico-theology as the very foundation of natural history. The desire to know about nature and the ability to wonder at the wisdom of the Creator, he asserted, had been implanted in us by God himself. For just as all of nature had been created 'for the sake of man', so man had been created 'to praise the Creator'. Like his predecessors, Linnaeus also emphasized that the natural sciences were in harmony with biblical revelation. Indeed, science had definitively proved the Bible to be a truly divine revelation, he claimed, for since scripture contained scientific facts unknown in antiquity, it was obvious that the humans who had written them down must have been 'guided by the highest', rather than following their own limited minds.[103]

To Linnaeus, then, the study of natural history was not only a religiously respectable activity: it was the very purpose of human existence. Or, as he put in the introduction to his catalogue of the royal natural history collection a few years later: 'Man is made for the purpose of studying the Creator's work, so that he may see and find the infinite wisdom of the omnipotent God.' But properly to contemplate nature, man needed not only his senses and his mind. More than anything he needed an instrument, indispensable to any true naturalist wishing to grasp the entirety of nature: a collection, allowing him to experience 'the wonders of the Creator, and in them, as in a mirror, daily [to] see His goodness and wisdom'.[104]

To what extent Linnaeus' views reflected those of his former teacher Stobaeus, in whose house he had first seen a collection, we may never know. What we do know, is that Stobaeus was among the first Swedish scholars to be influenced by physico-theology, making it more than likely that his museum was intended as a devotional space as well as an educational tool and an instrument of scientific research – aspects that were inextricably intertwined in the religio-scientific culture of physico-theology. Stylistically and aesthetically, the Museum Stobaeanum was undoubtedly already an archaic creation at its conception, which is hardly surprising given that it was mainly modelled on seventeenth-century textual sources. But the central idea of the *Wunderkammer* – namely, that a collection quite literally constituted a 'wonder-room', intended to inspire awe and marvel as well as to educate and enlighten – was an idea that would live on for decades after Stobaeus' demise, though in a new form. To the Linnaeans, true wonder was inspired not by a playful hodgepodgery of exotica and rarities, but by laying bare the underlying taxonomic order of nature.

And perhaps this is the most interesting aspect of the Museum Stobaeanum: that it was neither a product of old, superseded practices, nor of new, 'modern' scientific ideals, but of both. What the

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museum manifests is the continuity and longevity of practices, as well as the coexistence – sometimes harmoniously, sometimes discordantly – of old and new ideals within late seventeenth- and early eighteenth-century science. What tied these different ideals and practices together was the deeply emotional dimension of Baroque science, a dimension that turned the study of nature into an act of devotion, intended to strengthen Christian faith. And though this dimension was present in all scientific disciplines, it was perhaps most apparent in palaeontology, a discipline in which empirical research almost literally intersected with biblical history. Thus, it may not have been a coincidence that it was palaeontology to which Stobaeus devoted most of his attention, nor that it was the collection of fossils he regarded as the centerpiece of the Museum Stobaeanum. Being, quite literally, testimonies of the biblical deluge, fossils were, like no other natural objects, a testament to the divinity of scripture and the validity of the Christian faith, forcing us to wonder at the wisdom and omnipotence of God.

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64 K. Stobaeus, *De nummulo Brattensburgensi* (Lund, 1732), p. 22; K. Stobaeus, *Historia naturalis dendritae* (Lund, 1734), p. 4.

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67 J. Ray, *The Wisdom of God Manifested in the Works of the Creation* (London, 1691), p. 124. Boyle's *Opera*, as well as several works by Ray, are included in Corylander's catalogue of Stobaeus' private library, op. cit. (note 24), pp. 15, 47, 49.

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72 J. Swammerdam, *The Book of Nature, or The History of Insects* (London, 1758), p. 9. The Latin 1685 edition is listed in the catalogue of Stobaeus' private library; see Corylander, op. cit. (note 24), p. 17.

73 I am here relying on the German translation of the work: B. Nieuwentijt, *Die Erkäntnüss der Weissheit, Macht und Güte des göttlichen Wesens* (Frankfurt am Main and Leipzig, 1732), p. 859. For a valuable discussion of Nieuwentijt's work, see Vermij, op. cit. (note 70).

74 Vassányi, op. cit. (note 71), p. 85.

75 According to the catalogue of Stobaeus' private library, he had most of these works in German editions, though he also owned some of them (including Pluche's bestseller in four volumes, *Le spectacle de la nature*) in the original French; see Corylander, op. cit. (note 24), pp. 2, 14–15, 57, 60, 75.

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87 Lesser, op. cit. (note 86), pp. 187–204.

88 Ibid., pp. 712–13.

89 M. von Bromell, *Inledning til nödig kundskap at igenkiänna och upfinna allahanda berg-arter, mineralier, metaller, samt fossilier* (Stockholm, 1730), p. 44, and dedication, p. [4]. A similar reference to Luke 19:40 appears in Bromell's *Lithographia svecana*, in *Acta literaria Sveciae Upsaliae* 2 (1727), p. 308, where he invokes this passage in support of the diluvial theory of fossils. Hiärne's and Swedenborg's views are thoroughly discussed in Frängsmyr, op. cit. (note 79).

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104 C. Linnaeus, *Hans maj:ts Adolf Frideriks vår allernådigste konungs naturalie samling innehållande sälsynte och främmande djur, som bevaras på kongl. lust-slottet Ulriksdahl* (Stockholm, 1754), Preface, pp. 8, 14.

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