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bezoek ook de webstek: <http://www.bio.uu.nl/~palaeo/Paleobiologie/>.

De Paleobiologische Kring is het platform voor professionele paleontologen in Nederland en Vlaanderen. De kring beoogt de communicatie tussen de verschillende onderzoekers en onderzoeksgroepen te stimuleren en op te komen voor paleontologische beroepsbelangen.

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Redactie Nieuwsbrief

Frank Wesselingh & Jimmy van IJterbeek. Vragen, opmerkingen, bijdragen: mail naar wesselingh@naturalis.nl

Agenda Paleobiologische Kring

8 oktober 2005 Excursie

Paleobiologische Kring: Leuven, Pellenberg en Hoegaarden. Informatie op <http://www.bio.uu.nl/~palaeo/Paleobiologie/>.

Deadline bijdragen Paleobiologica Electronica 4: 1 oktober 2005

Ten geleide

Bij de eerste bijeenkomst in het kader van de Paleobiologische Kring, december 2004 te Utrecht, hield Prof. Bert Boekschoten (VU Amsterdam) een voordracht over de geschiedenis van de paleobiologie in Nederland. Van verschillende kanten zijn we benaderd of deze voordracht gepubliceerd zou kunnen worden. We hebben Bert bereid gevonden zijn voordracht op papier te zetten (met hulp van en dank aan Els Ufkes), waarmee het eerste Special Issue van de Paleobiologica Electronica een feit is. Rest ons nog te wijzen op de deadline voor bijdragen voor de Paleobiologica Electronica 4 op 1 oktober a.s. Veel leesplezier!

Frank Wesselingh & Jan van Dam

On Dutch paleobiologists from the past

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Paleobiology in the Netherlands has a history of affection at a distance. This distance is not caused by any lack of affection on the Dutch side. It is the fossil record that is out of reach for Dutchmen. Exposures of fossil-bearing strata are very scarce as compared to other countries; there is no direct challenge for the interested to study remains of extinct life as paleobiological documents.

Yet the general interest for paleobiology in the Low Countries has been more intense than you might expect. This is reflected in the many paleontology texts that were translated into Dutch, and in the museums that collected foreign fossils as showpieces, and for study.

Unfortunately, this part of our cultural history has not yet been surveyed satisfactorily. Therefore, and for lack of time, I cannot give a comprehensive review. Meanwhile, we all know the papers by our own predecessors, specialists in particular themes of paleobiology. So this sketch will concern general historical trends- the philosophy of some scientists, and the attitude of the public that bought their books and paid for their jobs.

The humble start of paleobiology in our country illustrates how foreign fossils are to most Dutchmen. It is recorded that a man was arrested in the town of Kampen, in 1550. He was a Westfalian pedlar, carrying around a box with fossil fishes collected from the Sendenhorst Cretaceous sandstone (figure 1).

*Lapis in quo Figura Trutta expressa, excisus è Lapidicina Baamberg
Diacef. Monasteriensis.*

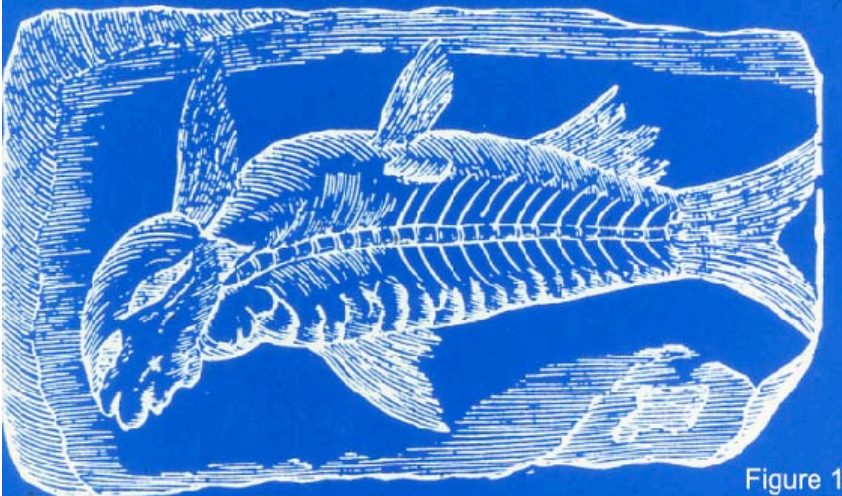


Figure 1

People in the street were permitted to look at this marvel, if they paid for the spectacle. This man was thrown into prison, as an impostor; there did not exist petrified fishes in stones, so the man had artfully draped fish skeletons in wet cement. The Kampen police proposed to destroy this falsification. Learning this, the poor man became desperate because showing these fossils for money was his living; without the fish he would be just a beggar. So the judge had mercy. The man was banished forever from Kampen, and he was thrown out of the

town gate together with his problem stones.

This was how Dutch officials felt about petrifications at the onset of the new age. A scientific approach was chosen by the historian Goropius Becanus from Hilvarenbeek in Brabant who published in 1569 a monumental history of the town of Antwerp. This city had newly rebuilt its walls, and in doing so abundant specimens of fossil Pliocene shells and fossil bones of whales were dug up. Even nowadays, it is difficult not to find fossils at building sites in Antwerp. They were commonly considered as relics of the deluge. Becanus studied the fossils, as an archaeologist would do nowadays; because he was eager to present Antwerp as the centre of the world. In fact, he tried to prove that Brabant was the site of biblical Paradise, and that Brabant language was spoken by Adam and Eve. This dialect would be primeval, and all other languages evolved from Brabantish. Becanus was more level minded when discussing the Antwerp shells and whalebones. He noticed that the fossils (sinistral Neptunea; figure 2) were completely different from living North Sea shells - not what you would expect if they were indeed washed up by the deluge. And Becanus cited a series of finds of brachiopod shells in Palaeozoic limestones, often used as building material in Antwerp - these shells were still more different from recent ones, and how could anybody explain that they were embedded into solid stone? This was obviously carrying the deluge idea too far. And Becanus decided that these shell-looking structures were the result of some mineral secretion, like dendrites are.

Becanus sided with the Catholic Church in the 16th century religious wars – he was a keen supporter of the inquisition. Not surprisingly, there came critic on his view from scientists in the Protestant Northern Netherlands. The father of historical linguistics, the Leiden professor Marcus van Boxhorn, published in 1647 a scathing comment on the speculations of Goropius Becanus. He proved that all Indo-European languages are derived from one common ancestor, predating even classical Greek.

The

So

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Figure 2

Frenchman Isaac de la Pereyre in 1655 published in Amsterdam "Humans before Adam" in which he drew the logical consequence of Boxhorn's observations; that the biblical time span of 6000 years since creation was insufficient to derive Chinese, Turkish, Arabic and European language from one original source. Of course, Pereyre's conclusion was considered heretical by the French clergy, by Sorbonne professors and by the violent crowd. His book was publicly burnt and he would have been burnt too if he had not been protected and spirited away by the Prince of Condé.

much for the first scientist that extended the age of the earth beyond biblical arithmetics. Closer to Becanus remained the Amsterdam theologian Isaac Vossius, in 1659. He also wondered whether shells in soil could give testimony of the Flood. But, he reasoned: freshwater fishes around the world were created at the onset of times. Had the deluge with its salty seawater covered all land, than all freshwater fishes would have perished. He concluded that the Flood was limited to Palestine only. The Lord said; "I will destroy man, and the beast, and creeping things, and the fowls of the air; for it repenteth me that I have made them". Vossius presumed that He flooded only the Near and

Middle East where man was living at that time, and not the surface of all continents. This argument against the universality of the deluge was taken very seriously, also by the Catholic opponents of Vossius. But not long afterwards, the young Danish student Steno came to Amsterdam and Leiden to matriculate and to study natural history with the famous Sylvius (the salt mineral sylvite was called after him). Steno learned sedimentology from the pioneer "Boeck Des Aardcloots" written by Simon Stevin in 1608. Steno was already an accomplished crystallographer and an eminent anatomist. His sedimentological training and biological excellence resulted in the publication of his now famous work on fossils and sediments in 1669. fossils were proven remnants of real organisms by careful comparison with recent material. These fossils were preserved in deposits left by the universal Flood. Credible enough in Tuscany where Steno worked by that time. Italian Pliocene fossils are not very different from actual Mediterranean fauna (figure 3). Steno produced a masterpiece of inductive logic and critical thinking - but he also stretched his evidence too far. Disregarding the argument of Vossius, he considered his paleobiological arguments as definite proofs of the deluge. This oversimplification brought him the scorn of the Dutch philosopher Spinoza, who warned expressly not to credit Steno's generalizations. But it earned Steno the lasting gratitude of the Catholic Church. He converted to that belief in 1667, wrote a letter against Spinoza, became a priest in 1675, a bishop in 1677 and died in 1686. He was beatified in Rome October 23rd 1988. Since that year we also have the Dutch Steno fellowship for young promising catholic Dutch doctors in the earth sciences.



Figure 3

Steno's scriptures were not as conclusive to his contemporaneans as they would appear to us now. Firstly, Goropius Becanus' argument, the dissimilarity of recent and fossil shells was not answered; secondly, the way fossils were preserved made people wonder. Some shells were present only as casts, others were found preserved entirely. The reason for this was mysterious because all shells were known to consist of calcium carbonate. We now know that this difference in preservation is caused by shell mineralogy; aragonite shells are readily dissolved, calcite shells stand a better chance for preservation. Aragonite however was not recognized as a special mineral unto 1780. And so we see manifest fossil casts classified as "stones with accidental shell-like structures" (figure 4). The baffling preservation problem also inspired the notorious Beringer book, the Lithographia Würceburgensis of 1726. Such unanswered questions kept authors close to the literal biblical account – witnessed by the 1745 van der Boot treatise on the exact date of creation: a quarter after two o'clock in the morning, Thursday 21st of March four thousand of years before Christ. Another statement of Steno fared better. In February 1673, he dissected the fresh corpse of a woman in the anatomy theatre of Copenhagen. Doing so, he stated that "the true aim of anatomy is to lift up our gaze, as a consequence of the artfulness of the body, to teach us to love the creator". The whole nature was a testimony to the veracity of the Holy Scriptures. This widespread idea became known as Natural Theology and dominated 18th century science. In the Netherlands, it inspired the oldest science award in the world, funded in 1753. The Leiden Legatum Stolpianum still exists, and now

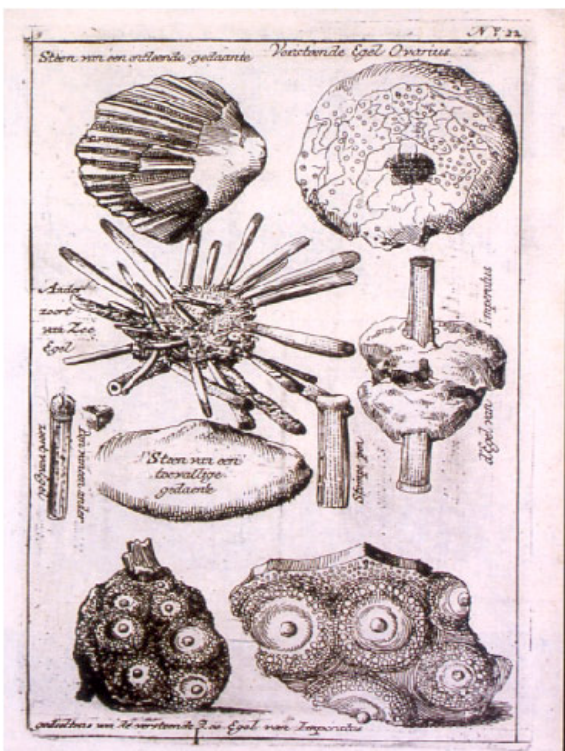


Figure 4

amounts to €2500. Prize winners write an essay on a theme suggested by Leiden Theology professors. The German Schwab, of Stuttgart, was the winner of the 1785 competition. He identified as a major cause of irreligiosity "the array of articles of faith which cannot sustain rational inquiry" and "the doctrine of predestination". Notwithstanding this crushing verdict on the compatibility of theological revelation and scientific experience, the prize has remained; as did



Figure 5

another pioneer institution inspired by Natural Theology, Teylers Museum in Haarlem from 1778 onward. A rich industrial, Pieter Teyler van der Hulst bequeathed his capital; and it was realized thanks to firm public support - civilized citizens belonging to the Mennonite brotherhood were particularly active, both here and in Maastricht. Teylers' Museum became a focus of paleobiological activity; Scheuchzers' famed *Homo diluvii testis* (figure 5) is on display there, as are some of the Beringer Lügensteine next to a magnificent fossil collection. And natural theology was also the guiding principle of the first Dutch textbook on natural history, the *Catechism of Nature* written in 1776 by the Zutphen reverend Martinet for the instruction of the children of the last stadtholder, Prince William V. Typically, mosasaur fossils discovered at Maastricht in these years were identified by Martinet as crocodiles swept from Africa by the waters of the Deluge; and interpreted as proof for the rightness of biblical texts. This all made natural science very respectable in 18th century Holland.

Natural theology was certainly also the driving force behind the science of the celebrated Linnaeus. He spent several years in Holland. As you can read in the King James bible, "Adam gave names to all cattle, and to the fowl of the air, and to every beast of the world". So, Carl von Linné gave himself the nickname New Adam and catalogued living and lifeless nature. Morphology was his great interest; his procedure has stuck, and many people, paleobiologists included work with it. As the earth was 6000 years old for Linnaeus and all species were created, fossils came in line with minerals. The Protestant Linnaeus of course became very popular in the Netherlands. An overview of natural history

according to Linnaeus's system was published by this Dutch admirer Houttuyn from 1761 onward. The study of fossils could not be very rewarding, if these were only the scant remains of actually living organisms, badly damaged by the forces of the Flood. Houttuyn, however, gave careful descriptions and depictions in the 1776 volume that deals with petrifications. He was puzzled by the apparent absence of trilobites from recent seas.

Nowadays, the other towering 18th century naturalist, the French Count of Buffon is less famed. He was a very different man. Born rich and catholic, he became richer and only nominally catholic. He was the first to give controllable experimental age of the earth; not 6,000 years but 77,000 years. Its publication in 1752 was a very brave act as the Paris University of course condemned such science as heresy, and would have the book burned and its author jailed. Fortunately, King Louis XV was wiser than Sorbonne professors.

Buffon went on to publish a huge *Natural History*. Morphology was but one of his themes; behaviour, ecology were the mainstays. Species were not constant, in Buffon's view; and he even went thus far to ponder whether apes and monkeys descended from humans by a process of degeneration. The works of Buffon were translated in Dutch, in 1773. In 1778 Buffon identified and published the very first fossil of a completely extinct and unknown animal - an American mastodont. Another heresy, because theologians knew for certain that the Creator did not produce extinct species unknown to man and therefore completely pointless. Linnaeus' method and enthusiasm inspired many Dutch followers from Houttuyn onward in descriptive paleobiology, up to nowadays. An example was also set by the German Knorr and Walch catalogues about fossils as collectables, translated in 1778. They contained the first descriptions of Dutch fossils, from Maastricht. The great majority of Dutch paleontologists from 1860 onward accepted evolution; and found Linnaean procedure the only one to make discussion of their shifty material feasible. But it is obvious that Buffon is one of the founding fathers of paleobiology. His disciple Lamarck gave, in his transformism, our science its evolutionary historical perspective. One of the very first to grasp the full significance of Buffon's philosophy was his friend the Dutch anatomist Petrus Camper (figure 6). His influential study on the Maastricht Mosasaurs of 1786 treats these spectacular fossils not as mineral curiosities but as remnants of extinct animals with a functional anatomy in their own right. Camper's son followed this path.

The period 1790-1830 was economically difficult, and strewn with political revolutions. Remarkable was the Leiden medical doctor Schmerling (figure 7) who discovered the first Neanderthal skull near Liege, in 1829 when this town was temporarily Dutch. His observations were really sensational: fossil man in the company of extinct elephant, rhino, hyena and bear. But his book was rejected by the public and by his colleagues. Lamarck and his ideas of humans descending from ape-like ancestors (because of a strong urge during orgasm) had become very much anathema, and you surely lost your nice academical job if you would adhere to such peculiar, politically incorrect and obscene ideas. Bilderdijk, the author of the very first Dutch Geology treatise (1813) (figure 8) contradicted

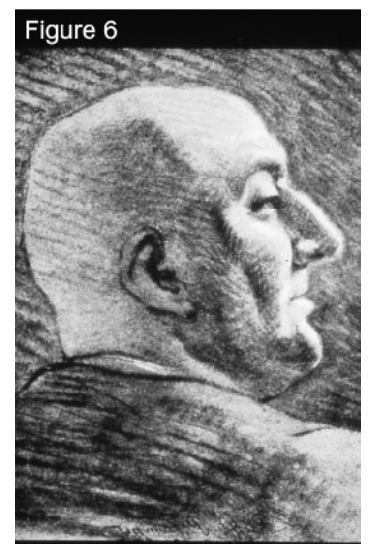


Figure 6



Figure 7



Figure 8

transformism squarely. Van Amersfoort, the rector magnificus in Franeker University, dealt with the theme in vague allusions only in his 1823 address. Schmerling died disappointed. Young scientists certainly remained convinced of the justness of most of Lamarck's views, but everybody carefully avoided the Lamarck word. The oration with which the famous surgeon P.C. Donders started his successful career as a professor at Utrecht University in 1848 consisted partly of a free translation of the *Philosophie Zoologique*; but he did not once mention the name of its author.

One of Donders' colleagues was the zoology professor Petrus Harting; and he was very successful in micropaleobiology research. His field was diatoms; and he wrote the very first Dutch bestseller in paleobiology, called "the power of the small"; it was translated into German (figure 9) and remained an influential book. Harting did much to make the general Dutch public aware of natural science. He founded the monthly "Album der Natuur" which built public support for government-funded university studies in science. Harting considered science as the sole leading principle for civilised people, and believed in a harmonic creation. He hesitated to publish Darwin's views in his journal; and after he did (ten years after 1859) he gradually lost religious faith, and hoped scientific humanism would curb the worst effects of "the survival of the fittest". Of course, many Dutch recognized that Darwin's subtitle was a citation from political economist Herbert Spencer, just as Darwin

borrowed from him the word "evolution". Darwin's book was also related to another earlier publication, the *Essay on the Principle of Population*, by Malthus. Suddenly, paleobiology became a political issue instead of an innocent pursuit to the glory of God. This is illustrated by developments in big neighbour, Prussia. Because of vehement discussions in the Reichstag it was forbidden there in 1876 to teach evolution at any school - and in 1879 even the whole of biology was excluded from primary and secondary schools. In Belgium, state universities were conservative and catholic. So a private university was founded, the liberal *Université Libre de Bruxelles*. In Holland, state universities sided with science for science's sake, so in Amsterdam a new university was funded, with a Christian charter; the Free



Figure 9

University. At the three state universities, chairs in earth science and in biology were installed. It was in these turbulent times, that the Amsterdam anatomist Eugene Dubois, a confirmed Darwinist, made his historical discovery in Indonesia; the *Pithecanthropus* fossils that even adorn his tomb in Venlo cemetery. Dubois seminal contribution to paleobiological science has been highlighted lately, so I will mention here only the tenuous opposition by the Leiden geology and palaeontology professor Karl Martin, who was not an evolutionist. Martin was a very meritorious descriptive palaeontologist, who founded the State Museum of Geology. But he balked at Dubois' findings; and his son



Figure 10

even wrote a novel suggesting that *Pithecanthropus* was the offspring of enforced coupling of a male orang utan and an Indonesian girl.... A special elaboration on Darwinian theory were the views of the Jesuit vertebrate palaeontologist Teilhard de Chardin, presently the official stand taken by the Vatican. Teilhardism was regarded by the successor of Dubois in Indonesia, my teacher von Koenigswald in Utrecht (figure 11). And it became also the view promoted by the Leiden State Geology Museum during its last decades, in the 20th century; school classes were taught that evolution was a process affecting horses and zebra's, not humans. Its successor Naturalis, at Leiden now includes human evolution, but Teilhardism remains an undercurrent in Dutch and Flemish universities and in exhibitions; as a proof I



show a paragraph from a 2003 catalogue on fossil humans. It says, "Darwin's evolution has been generally accepted. But sometimes, mistakenly, it is concluded that we descend from monkeys or apes"..... (figure 12).

J.H. Bonnema, in Groningen, investigated ostracod microfossils to ascertain age and provenance of early paleozoic limestone erratics from the boulder clay. Paleobiological aspects of microfossils also captivated his interest, and that of his student I.M. van der Vlerk (later

professor in Leiden). Both were actively involved in the upsurge of stratigraphic micropaleontology that became a major theme in Dutch 20th century earth science.

At the onset of the first World War, paleobiologist Ernst Haeckel signed the manifesto of German scientists vigorously supporting the Kaiser. As the Netherlands remained neutral, this did not lead to the disruption of our scientific network. The rise of national socialism in Germany was worse. A world paleobiology authority, Othenio Abel, turned nazi; a renowned female paleobiologist, Tilly Edinger, was hounded from

Frankfurt because of her Jewish descent. The depression of the thirties helped to end Dutch subscriptions of German paleobiological journals, and fired absences from German meetings. Paleobiology became suspect as vulgar Darwinism became part of Nazi lore.

To some of you, these ideological vagaries may come as a surprise. Independent minds, though, will always stand up. One of these was the late Utrecht paleobiologist Paul Sondaar, hugely fascinated by fossil island mammals. He stood for the idea that early man also invaded islands like Sardinia and Flores. He contributed and inspired seminal



Paul Sondaar

op aarde is ongelooflijk gevarieerd. Charles Darwin verklaarde de oorsprong van die variatie met zijn evolutietheorie. Zijn denkbeelden en de consequenties daarvan ontmoetten aanvankelijk weerstand omdat zij in tegenspraak gezien werden met de bedoeling van de bijbelse Schepper.

Inmiddels is Darwins evolutietheorie algemeen aanvaard. Maar soms wordt er nog - ten onrechte - uit afgeleid dat wij van de apen afstammen. Miljoenen jaren geleden sloegen de voorouders van apen, mensapen en mensachtigen elk hun eigen evolutionaire pad in.

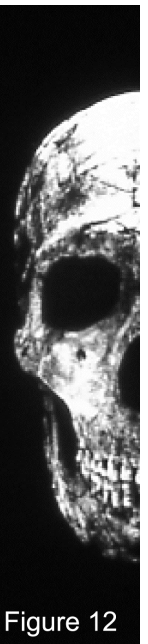


Figure 12

paleobiological studies on fossils from these and other islands; after retirement, he died at the age of 67 on March 25th 2003. Sadly he could not see his theories vindicated by the recent find of Flores man in the cave discovered by the Dutch missionary Verhoeven, half a century earlier and studied by Sondaar.

The description and interpretation of Flores man, the third species of human, contemporaneous with Neanderthal man and our own ancestry, fuels the general philosophical discussion on the meaning of plural mankind, and on human dignity.

I pay tribute to Paul and Paul's work here; a recent chapter in the long history of the Dutch contribution to that major science, Paleobiology.