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Reijer Hooykaas

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On 4 January 1994 Reijer Hooykaas, who for several decades was a leading spokesman for Dutch history of science, died in Zeist. He was born on 1 August 1906 at Schoonhoven, the son of the director of a silver manufacturer. He attended the Rijks Hogere Burgerschool in Gouda and from there went to the Rijks Universiteit Utrecht, where he graduated in chemistry (1930), but by then the character of Hooykaas's studies had begun to move in a new direction. This was partly under the influence of his tutor, the chemist Ernst Cohen, who had a strong but rather unsophisticated interest in the history of chemistry. It was the colloid chemist Prof. dr. H.R. Kruyt, however, whom Hooykaas eventually chose as his promotor at Utrecht, despite the historical character of his dissertation. This bore the title *Het begrip element in zijn historisch-wijsgeerige ontwikkeling*, and was obviously written very much under the influence of the classic work of the German neo-Kantian Kurd Lasswitz, *Geschichte der Atomistik* (1890). The introduction to this early work of Hooykaas is headed by a quotation from Anatole France that in a single sentence encapsulates the philosophy that motivated the whole of his later career: 'La véritable histoireest celle des maximes et des opinions, plutôt que des guerres et des traités'. In other words, he regarded himself primarily as a historian of ideas, but one who was prepared to cast his net wider than the natural sciences alone.

From 1930 until 1948, whilst working on his doctoral dissertation, Hooykaas taught chemistry, first in the Christelijke HBS-A in Amsterdam-Zuid, and from 1932 in the Lyceum at Zeist. He was nominated extraordinary professor at the Vrije Universiteit, Amsterdam, in 1945, and was made ordinary professor there in 1948. His was the first full chair in the subject in the Netherlands. E.J. Dijksterhuis (1892-1965) only been made extraordinary professor in Utrecht from 1953 and in Leiden from 1955, and not until 1960 did Utrecht honour that great scholar with an ordinary chair, two years before he had to retire on the grounds of age. Hooykaas in fact succeeded him at Utrecht in 1967, himself retiring in 1976.

By virtue of the reluctance of his two universities to give him the recognition he deserved, Dijksterhuis had never really been given an opportunity of building up a school capable of continuing his work. Hooykaas was more fortunate, and at Utrecht he was able to put his own very firm imprint on the history of science as practised there. He regarded his subject as one with an existence in its own right, but also as one with a practical value, that could make science students better scientists. Hooykaas's own beginnings in chemistry resulted in his giving a strong chemical flavour to Dutch history of science, but he looked further afield for his materials. He had a preference – as one of his former students put it – for *de 'harde' wetenschapsgeschiedenis, alléén zó kan deze dienen als grondslag voor*

*een nadere plaatsbepaling waarbij ook de beoefenaar van de moderne wetenschap gebaat is.*¹

This is not to say that he overlooked the importance of the humanities, or the social responsibility of scientists, although the movement that in the 1970s used this phrase as its battle-cry was one with which he was never really in tune.

Hooykaas's historical writings can be divided roughly into four groups: on chemistry, on geology and biology, on humanism and its ramifications in science, and on the interrelations of Christian belief and scientific progress. His 1933 dissertation on the concept of 'element' dealt with more than chemistry, of course. As he wrote in his introduction:

*Een juist oordeel over hen [de oude chemici] kan slechts geveld worden als men de moeite neemt zich in het verleden in te leven, zich te plaatsen op het wijsgerig standpunt van een tijd, en het later ontdekte feitenmateriaal te vergeten.*²

This he of course did very successfully, and his first book is a rich collection of insights, with much relevant quotation, covering important episodes between the Middle Ages and modern times. It provided him with the material for a number of lectures and historical articles in the *Chemisch Weekblad* and *Janus*, and must have heightened the historical awareness of many chemists who had previously been almost wholly ignorant of this historical dimension of their work.

Like so many others of his generation, his view of the international scholarly scene was not unaffected by the second World War, as he made clear at the first post-war international meeting at Lausanne in 1947. He had continued to publish during the war, however, including a long study of Robert Boyle, and his reputation in the Netherlands was growing rapidly, but the Lausanne meeting brought his work to the notice of the international community too. The interest shown in his writings undoubtedly had much to do with his abiding interest in the interrelations between science and religion. He had touched on this theme at length in a study of Pascal, published in 1939,³ and the subtitle of his study of Boyle was *Een studie over Natuurwetenschap en Christendom*.⁴ A number of similar works followed, and while they formed only a fraction of his literary output, they are what seem to have attracted most interest in the outside world. This was true, curiously enough, among a group of social historians of science with whom he had little real affinity.

¹ H. Kubbinga, *Chemisch Weekblad* 90 (12 feb. 1994) p.6.

² *Het Begrip Element ...*, Drukkerij Schotanus en Jens, Utrecht, 1933, pp. 12-13.

³ 'Pascal zijn wetenschap en zijn religie', *Orgaan* (1939) pp. 147-178.

⁴ Loosduinen, z.j. 1942. Also published in *Orgaan* (extra aflevering, 1942), 126 pp.

In the late 1940s Hooykaas's historical interests turned in the direction of sciences bordering on chemistry. He wrote on crystallography, for instance, and on evolutionary biology – which was still seen by some to be in conflict with Christian belief – and also on geology, a subject related to both biology and theology in obvious ways. From 1948 to 1960 he taught mineralogy to students of chemistry. What will perhaps remain Hooykaas's most valued book was a product of this period: *Natural Law and Divine Miracle. A historical-critical Study of the Principle of Uniformity in Geology, Biology and Theology* (Brill, 1959). When it was reprinted in 1963 the first part of its title had been dropped, giving a far better idea of its contents, for its aim was to explain the philosophical structure of geological and palaeontological theory. He did this partly by reference to nineteenth-century work and partly by reference to related debates in modern geology.

Geology is an unusual science: it is empirical and yet the processes it considers are in the past, beyond observation and experiment, and to reach them the geologist is obliged to introduce a principle of continuity, of uniformity of geological behaviour. Hooykaas investigated what had been said in the past about this question of uniformity and found from a thorough study of primary material that 'uniformity' had been understood in many different senses. There was, for instance, the idea that physical causes operating at present have always operated; but in a stronger version some geologists wished to say that the intensity with which those causes operate does not change. Theirs is a stricter form of uniformitarianism. The 'catastrophism' in which so many geologists believe was not opposed to the first idea – which Hooykaas called 'actualism' – but only to the second. By giving some of the nuances of the concept of uniformity, Hooykaas made possible a better understanding of the work of Lyell and Hutton, and also of the biologists debating evolution.

To give a concrete example of the value of Hooykaas's analysis he was probably the first historian of science to see clearly the relationship between the ideas of Lyell and Darwin. Darwin's evolutionary theory had been previously regarded as a simple logical extension of Lyell's uniformitarian geology. Hooykaas saw that Darwin, unlike Lyell, was no uniformitarian, for he accepted that there is a progression in life-forms; and he was no simple 'actualist', since he could not show evolution continuing at the present time.

When Hooykaas came to examine theological factors in all this geological work, he again greatly improved on the quality of previous historical analysis. What he wrote of Hutton was especially perceptive, for whereas Hutton had been seen as a positivist, hostile to theology, Hooykaas showed him to have been what he called a 'semi-deist', dividing the world into two areas. In one area, physical law was supposed to operate, while in the other, an interventionist realm, the God of theism could act. Buckland and Sedgwick were put in the same category as Hutton, while others – such as Hugh Miller – were seen to have been true

theists, in the sense that they did not believe it possible to draw a distinction between the natural and the supernatural. This last view was the one with which Hooykaas himself showed most sympathy, and he called it the 'biblical view' of nature, although it has probably never been particularly popular with working scientists, even those of a Christian persuasion.

Theology became an increasingly common theme in Hooykaas's writings in the 1960s and 1970s. Much was being written at that time concerning the role played by Puritanism in the rise of modern science, and in 1969 he chose this as his theme for a series of lectures he gave in Edinburgh.⁵ In the first part of the resulting book, he argued that the Greek heritage was lacking in one important ingredient of modern science: the separation of nature from divinity. The Biblical concept of creation, he believed, made this insight possible, so that the Bible had major responsibility for turning nature into a suitable object of scientific study. Added to this, he said, the Biblical account of Creation was not rationalistic: it forced Christians to make an empirical study of the world. If Hooykaas was right, why did all these influences not materialize sooner? According to him, these properties of the Biblical view of nature could only be influential when Protestantism came along, and put the Bible in a position of supreme authority.

He was of course criticized for all this – for example, for having ignored such an important Catholic counter-example as Galileo from after the Reformation, and the many empirical scientists from Catholic countries before it; and also for having ignored most modern historical literature on the causes of the scientific revolution. His arguments, however, were presented with conviction and sincerity, and helped to stimulate much debate in Britain and America.

His influence on the outside world was not only in English-speaking countries. From 1962 onwards he regularly visited the university of Coimbra in Portugal, and he published his lectures as a book in Portuguese, which was eventually turned into a text-book in Dutch, *Geschiedenis der Natuurwetenschappen – van Babel tot Bohr*.⁶ At the same time he made a study of the influences of voyages of discovery on Portuguese literature in the sixteenth century.⁷ He was fascinated by the conflict between the empirical knowledge amassed by the explorers and the arguments used by university scholars, whose knowledge came chiefly from books and simple reasoning. Not surprisingly, Hooykaas's work was highly influential in Portugal. He was given an honorary doctorate of the university of Coimbra in 1969, and it is largely due to him that the history of science is studied in science departments there.

⁵ The Gunning Lectures, printed as *Religion and the Rise of Modern Science*, Scottish Academic Press, Edinburgh and London, 1972, 176 pp.

⁶ Utrecht, 1971, 1976, 289 pp.

⁷ See his *Humanism and the Voyages of Discovery*, London, 1979.

Hooykaas's theological interests took another turn with a discovery he made of a lost work by Georg Joachim Rheticus (1514-1574), containing a theological apology for the Copernican system, based largely on quotation from the Bible. (Rheticus was the pupil of Copernicus, and brought his master's work into the public domain during Copernicus's lifetime – the great *De Revolutionibus* only appeared in the year of Copernicus's death.) Hooykaas's edition of the text of the newly discovered work, and a translation of it into English, appeared under the auspices of the KNAW in 1984. He worked for many years too on a book dealing with the reception of Copernicanism in the Netherlands, but never published more than a short survey of his materials.⁸

Among his many distinctions Hooykaas was made an effective member of the Académie internationale d'histoire des sciences in 1957 and Ridder in de Orde van de Nederlandse Leeuw in 1965. The many facets of his scholarly work brought him into contact with many other scholars. I regret that I did not have an opportunity of knowing him well, but it is significant that when I first met him it was 300 metres underground in a Polish saltmine, and not in Utrecht. He leaves a wife, and five children and their families. At the end of a study he made of the Baconian tradition in science, Hooykaas translated some lines of Abraham Cowley that compared Bacon with Moses, who

*...vond in barre wildernis het rechte spoor
Dat leidde naar de grens van het Beloofde Land.
En van de bergtop waar zijn geest op stond
Zag hij, en wees aan ons, die zegenrijke grond.*

Perhaps it is of some consolation to his family in their loss that these ambiguous lines could just as easily be applied to Reijer Hooykaas, for his own visionary treatment of the subject to which he dedicated his entire career.

⁸ *The reception of Copernicanism in England and the Netherlands*, in *The Anglo-Dutch Contribution to the Civilization of Early Modern Society*, London, 1976, pp. 33-44.