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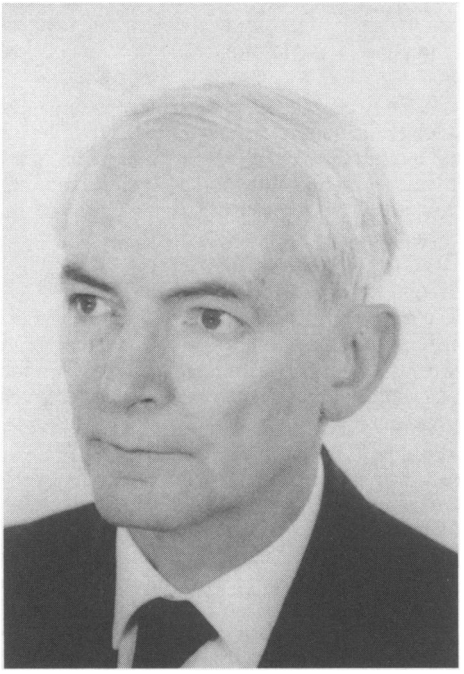
Eloge

REIJER HOOYKAAS, 1 AUGUST 1906–4 JANUARY 1994

Hooykaas was among the pioneers. Along with a range of other gifted loners in the 1920s and 1930s, he taught himself how to leave behind customary roots seekers' and philosophers' history of science in a fresh search for ways and means to treat the past in its own right, for the various frames in which scientists have set themselves problems and struggled for solutions. The effort pervades the programmatic introduction to the book Hooykaas published in 1933 as his doctoral dissertation, *Het begrip element in zijn historisch-wijsgeerige ontwikkeling* [*The concept of element in its historical-philosophical development*]. This introduction takes its place among several other pieces of the interbellum period in laying down rules—or, rather, sketching a mindset—required for turning the history of science into real history. The sense of personal discovery exuded by the piece, and indeed by the entire book that followed, was never to leave Hooykaas. It contributed in no small measure to the captivating liveliness of his teaching—the message and the maxims he tirelessly sought to convey to his students were the fruit of his own personal quest.



Reijer Hooykaas was born in Schoonhoven, in a Calvinist family of local silversmiths. He studied chemistry at the University of Utrecht. The choice of a topic for his dissertation was hardly an obvious one—the more so since, in the 1930s, it was not at all clear whether he would ever have a chance to pursue the history of science other than as a spare-time occupation. Hooykaas became a chemistry teacher at two high schools in succession, using his spare time first for completing his Ph.D. thesis and then for writing a range of articles published mainly in two Dutch periodicals: a chemists' weekly, for which he elaborated findings of his dissertation; and a journal for Protestant scientists and physicians, which became the somewhat unlikely recipient of profoundly original studies on Kepler's concept of hypothesis, Pascal's science and religion, and more. The latter publications, in particular, aroused sufficient interest in the history of science at the Free University of Amsterdam (the intellectual center of Calvinism in the Netherlands) that a chair was created immediately after World War II—the first anywhere in the country—which Hooykaas was called to occupy. In 1967 he moved to the University of Utrecht in order—after an interregnum involving Dirk Struik and Jerome Ravetz—to succeed E. J. Dijksterhuis. Here he stayed until he retired in 1976, using the time not only to pursue his own studies and to create a certain amount of *Nachwuchs* but to turn what had been little more than a room in a large building into

a sparingly housed yet full-fledged and well-equipped Institute for the History of the Exact Sciences. Never an easy man either for himself or for those who dealt with him professionally, he never again crossed the threshold of his institute after his retirement; but in his spacious home with its well-stocked library he went on to make contributions to the field almost to the end.

The most striking aspect of Hooykaas's historiographical legacy is no doubt its versatility. Atomism both ancient and modern, alchemy, iatrochemistry, the Chemical Revolution—all broached in the dissertation—were the subjects of many articles, some written in English for *Janus* or the *Archives Internationales,* some in German for *Sudhoffs Archiv.* The history of science in the Netherlands naturally received some in-depth study—for example, essays on Isaac Beeckman, on Christiaan Huygens, on Dutch scientific societies, on Copernicanism in the Netherlands, and on what science meant for government policy in the Golden Age of the Dutch Republic. Historical problems of science and religion provided food for many articles and some books, including an authoritatively edited and annotated edition of Rheticus's lost theological defense of heliocentrism rediscovered by Hooykaas. In the early 1960s he taught himself Portuguese, going on to do pioneering work on the significance for science of the Voyages of Discovery and the intellectual upheaval these created in a humanist culture—here *Science in Manueline Style,* which appeared both separately and as a part of Volume 4 of the *Obras completas de D. João de Castro,* was the principal fruit. The history of crystallography caught his attention, leading to lengthy studies of, among others, Romé de l'Isle and Haüy. Uniformitarianism and other basic issues in the history of geology made for several books and articles, most of them written in English. Petrus Ramus was the subject of a book, this one in French. Methodological issues came in for scrutiny in yet other contexts. Nor is this quite an exhaustive list. Still, it should go far to explain how in 1971 Hooykaas could publish (in Dutch, to be sure) a "History of the sciences from Babel to Bohr," which provides a continuous story by stringing together summaries of his own publications and little else. No other serious historian of science, I think, could have pulled off such a feat.

The key question, of course, is whether Hooykaas paid the price of superficiality for his uniquely wide range. My unhesitating "no" must be accompanied by a disclaimer: Who am I (or any other individual historian of science, for that matter) to judge? To be sure, historians of (for example) crystallography, geology, and Portuguese navigation—often unbeknownst to each other—count him among the great in their respective domains. But what exactly does his greatness as a historian of science consist in?

I can answer this question only in my own limited domain of expertise. To me, then—as to many another, both inside and outside the profession—Hooykaas has served as an ongoing source of inspiration in a variety of respects. First, in his qualities as a teacher. As a Leyden history student in search of a suitable minor in the late 1960s, I heeded one medieval historian's counsel and took the train to Utrecht to hear what a certain Professor Hooykaas would have to say on the history of science (a subject then known to me primarily through Arthur Koestler's erratic yet inspiring *Sleepwalkers* and conspicuous for its absence from all the history textbooks I had ever digested). The man behind the lectern did not do what I had subconsciously feared: dutifully rattling off in technical language one heroic scientific feat after another. Instead, here stood a man with a story to be told in the grand manner, a man—for all the formality of his conduct—with an almost charismatic capacity to grip his audience, to make the past of science seem alive and exciting and almost present, through that marvelous directness and plasticity of expression that some rare people possess and that those who lack it find so hard to give an impression of. I have never ceased to recognize the same qualities within minutes of my arrival when, after his retirement, I came from time to time to see Hooykaas and his wife at home. Conversation with him as a rule was mostly monologue (though he enjoyed being contradicted if he felt his interlocutor had done his homework), yet I invariably felt uplifted and intellectually refreshed by his persistent lack of tolerance for presumptuousness and obscurity, his perceptive capacity to set aside subsidiary issues and go straight to the heart of a matter.

Where, then, was the heart of the matter of the history of science located, in Hooykaas's view? Not in one single feature; not in some all too beautifully fitting system. Hooykaas detested monolithic thinking and, for all his love of order and orderliness, abhorred grand systems. "The Bible has no system," he wrote repeatedly of that primary source of inspiration to him. Rather, basic to Hooykaas was his concrete, almost tangible conception of nature. He was certainly not a simpleminded apologist for Protestantism in his many studies on the historical relations between science and religion, as a glance at his masterful 1939 article on Pascal or his 1943 book on Boyle

will reveal, yet it is clear that a biblical conception of nature as freely created by a sovereign God in accordance with His own ways (as distinct from the ways of human beings) stood at the center of Hooykaas's historical thought. Hooykaas found the historical drama of humanity's ongoing effort to gain a grasp on nature to reside in this: how the human mind, with all its subjectivity and its capacity for self-deception, but also its piercing gifts of discovery, has through the ages come to terms with what he once felicitously called "the whimsical tricks of nature." Time and again our intellect seems to have caught nature in its net; time and again nature, induced by our very effort, breaks out of the net by exhibiting novel features that time and again may fail to comply with what we had been led to expect. Science in its ongoing advance, in short, never ceases to display quite variously mingled contributions from facts (given by nature, yet entirely subject to our mode of interpreting them), from broad conceptions like the idea of unity, of order, of simplicity, or of harmony, and from those intellectual tools, such as theories and hypotheses, that reflect the scientist's creative imagination. It was Hooykaas's conviction that no generalized rule can tell the scientist how these three basic elements ought to be combined in any given case; the historian of science must learn to cope with the endless variety of ways in which this triad (facts, broadly leading ideas, and specific theorizing) has gone into the making of what at any given point in time could with justice be called "science."

Hooykaas's primary tools in grappling with this variety in any given case were always manuscript and printed sources, which he enjoyed more than much derivative work in the literature at large and which he read in many languages and interpreted with the help of an astonishing, widely flung erudition. Defining in advance and in broad terms what kind of issues he was after, he approached his sources—more often than not, the collected works of one or another scientist—in such a way that a picture gradually emerged, which was then in orderly fashion and terse prose sketched out under successive headings, but with little running commentary on what held the consecutive arguments together. Thus, to read Hooykaas sometimes requires hard work not always spent on it. For example, his quite sophisticated thesis on how Protestantism, as one historical agent among many others, furthered the birth of modern science (very roughly, by bringing a biblical respect for the empirically given to an excessively rationalized Greek legacy in science) has sometimes been misconstrued and held up for easy rebuttal in view of Galileo's contributions to that process—as if Hooykaas, of all people, were unaware of any outstanding seventeenth-century science done by Catholics. Not that Hooykaas's stance was immune to criticism: he never quite faced the issue of how, if indeed the biblical worldview formed a significant ingredient in the rise of modern science, this new ingredient began to affect Catholic scientists like Galileo and Pascal in the sixteenth and seventeenth centuries after rather consistently having failed to do so during the reign of scholasticism. But that is a somewhat subtler issue, which does not call into question basic capabilities Hooykaas was really in full command of.

Hooykaas may be called a historian of scientific ideas only if we take the notion in a broad sense. "Thinking with the hands" was a theme dear to him—he loved to point out how much scientific advances have owed to practical people like mariners, alchemists, medical doctors, engineers, and other skilled craftsmen with a creativity of their own. On this topic, as on that of "Art and Nature," to which he devoted one of his finest pieces (reprinted with twenty-seven others in a collection entitled *Selected Studies in History of Science* [Coimbra, 1983]), the sensitivity to sophisticated craftsmanship picked up in his youth among the silversmiths stood him in good stead. To Hooykaas, divisions of any kind between "internal" and "external" history of science were artificial constructions, needlessly and indeed harmfully separating domains that properly form an integrated whole: the historian's search for a broad understanding of how humanity has sought to fit one "key" after another into the "lock of nature."

Admiration for the achievement of science and love of the past animated all Hooykaas's work; but what drove him as a historian of science went beyond those sentiments. While his colleague and predecessor Dijksterhuis sought to bridge a profoundly regretted chasm between science and the humanities by tirelessly pointing out that science, too, must be regarded as legitimately belonging to culture in its fullest sense, Hooykaas, in a mirror effort, aimed above all for what he used to call a "humanization of the sciences." Like Dijksterhuis, he felt the history of science to be by far the most accessible road toward that lofty objective.

Until almost his last days Hooykaas strove to complete the book that, in my opinion, exemplifies more comprehensively than any other work he wrote the unique Hooykaas approach to the history of science. That book was meant to

be an expanded reworking of the Gifford Lectures he delivered in 1975/1976 at the University of St. Andrews—one of the many scholarly honors he received during his lifetime, both at home and (more frequently) abroad. Ten of the sixteen lectures were turned into completed, well-annotated chapters before his death. The book, which Hooykaas entitled "Facts, Faith, and Fiction in the Development of Science" by way of expressing the threefold constitution of the scientific endeavor I have outlined, has been accepted for publication by Kluwer Academic Publishers and is due to appear in the fall. No better place to go for those who, in the space of some 350 pages, wish to make or renew their acquaintance with one of the original minds in the historiography of science.

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