

JACOB CLAY
1882-1955

Clay, whose father was a prosperous farmer in Berkhout (North Holland), was born on 18 January 1882. He attended the Erasmiaans Gymnasium at Rotterdam and from 1900 to 1907 studied physics at Leiden with H. Kamerlingh Onnes and H.A. Lorentz. He took his degree in 1908 with a dissertation on *De galvanische weerstand van metalen en legeringen bij lage temperaturen* (The galvanic resistance of metals and alloys at low temperatures). Shortly after getting his degree he married a fellow-student, Tettje Clasina Jolles. They had one son and two daughters.

Already in 1906, even before he passed his doctoral examination, Clay had become a teacher at secondary schools. He started teaching at an HBS in Leiden and from 1907 to 1920 he taught at Delft. At the Technical College in Delft he was *privat-dozent* from 1913 to 1920. During these years at Leiden en Delft Clay showed himself to be an ardent follower of the neo-Hegelian philosopher G.J.P.J. Bolland and he was active in philosophical circles. In 1915 he published a book on the history of the concept of the law of nature.

In 1920 Clay became professor of physics at the new Technical College in Bandung (Indonesia). Before his departure to Indonesia, Clay stayed for some time with Ernest Rutherford in Cambridge to keep abreast of the latest developments in experimental physics. In Bandung, he had to build up a new laboratory, to which he attached a school for instrument makers (just as Kamerlingh Onnes had done in Leiden). In his research, Clay and his wife specialized in atmospheric electricity and cosmic radiation (detected in 1912 by V. F. Hess). Their first results were published in the *Proceedings of the Royal Academy of Sciences*. On a voyage from Indonesia to Holland and back (1927-1928) Clay—who had taken his ionization chamber with him—discovered the diminution of the intensity of cosmic radiation in the region around the equator, the so-called latitude effect. Clay assumed that this effect was due to the magnetic field of the earth, which meant the existence of charged particles in cosmic radiation. In addition to his scientific research Clay also stimulated cultural life in the colonies in general.

When, in 1929, Clay returned to the Netherlands to become professor of experimental physics at Amsterdam, he continued his research on cosmic radiation. International recognition for his dis-

coveries was delayed because of opposition from R.A. Millikan, but after some expeditions around the world in 1935 even Millikan had to give in. In 1936 Clay became a member of the Royal Netherlands Academy of Arts and Sciences. Some 200 articles and 22 dissertations prepared under his supervision attest to his systematic research in cosmic radiation, ionization, meteorology and related fields. After the Second World War, Clay became one of the driving forces in the restructuring of science in the Netherlands. Partly through his talents as organizer of science the Stichting Fundamenteel Onderzoek der Materie, FOM, (1946), the Mathematical Centre (1946) and the Norwegian-Dutch Joint Establishment for Nuclear Energy Research (JENER) at Kjeller got off the ground. After his retirement in 1952 Clay was for some years Chair of FOM.

As in Indonesia, Clay's activities were not restricted to science and he devoted much time once again to philosophy. Shortly before his move to Bandung he had broken with Bolland and his devotees, and now he concentrated on the study of the foundations of physics. In 1936, he was one of the founding fathers of the philosophical journal *Synthese*. After his retirement he was director of a private philosophical institute (Internationale School voor Wijsbegeerte). Clay died on 31 May 1955.

Primary works

Poggendorff, vol. 6, 455; vol. 7B, 846-849. *Schets eener kritische geschiedenis van het begrip Natuurwet in de nieuwere wijsbegeerte* (Leiden, 1915); *De ontwikkeling van het denken* (Arnhem, 1920, second impr. Utrecht, 1950); 'Penetrating radiation', *Proceedings of the Royal Academy of Sciences* 30 (1927) 1115-1125, 31 (1928) 1091-1097; *Rayons cosmiques* (Paris, 1938), written in collaboration with P. M. S. Blackett and G. Lemaitre; *Ontstaan en ontwikkeling van het energiebeginsel* (The Hague, 1942); *Kosmische stralen* (The Hague, 1948); *Atmosferische electriciteit* (The Hague, 1951); *Wetenschap en maatschappij* (Amsterdam, 1952); *Recording instruments* (Amsterdam, 1953); and numerous articles in *Physica*.

Secondary sources

Nederlands tijdschrift voor Natuurkunde 18 (1952) 241-244 and 21 (1955) 149; G.W. Rathenau, in: *Jaarboek van de Koninklijke Nederlandse Akademie van Wetenschappen* (1955-1956) 209-212; *Synthese* 9 (1955) 423-432; E.W. Beth, in: *Algemeen Nederlands Tijdschrift voor Wijsbegeerte en Psychologie* 47 (1954-1955); J.J. Boasson in *Jaarboek van de Maatschappij van Nederlandse Letterkunde te Leiden* (1955-1956), Levensberichten, 55-58; K. van Berkel, 'Wetenschap en wijsbegeerte in het werk van Jacob Clay', in *idem*, *Citaten uit het boek der natuur. Opstellen over Nederlandse wetenschapsgeschiedenis* (Amsterdam, 1998) 241-263. J.A. Prins, in: *DSB*, vol. 3, 312-313; H.F. Jongen, in: *BWN*, vol. 1, 111-113.

[K.v.B.]