

Memorial to Phillip H. Kuenen

1902-1976

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Few geologists have had a greater impact on their science than Phillip Kuenen who died in December 1976. Born in Dundee, Scotland, where his Dutch father was a physics professor, he moved with his family to Leyden, Holland, at the age of five. Because his mother was English, he always had a fine command of the English language. He became interested in geology as a boy and became a student under B. G. Escher with the well-known L. V. de Sitter and J.H.F. Umbgrove at Leyden University. Obtaining his Ph.D. at the unusually youthful age of twenty-three, he served a short time as an observer in the Air Force and then in 1926 became an assistant professor of geology at Leyden. During this time he cooperated with his former professor, Escher, in investigating

physical processes and conducting laboratory experiments.

In 1929 Kuenen was chosen as the geologist to accompany the Snellius Expedition to the Dutch East Indies (Indonesia). This gave him an appreciation of many things related to marine geology. He wrote his fine reports on the expedition covering bottom samples, bathymetry, coral reefs, and volcanoes. It also led to his writing one of the very few textbooks on marine geology. This was a valuable book, but the rapid postwar build-up of marine geology soon dated it, and because of Kuenen's growing interest in turbidites and their relation to ancient sediments, he never got time to revise this first edition.

Although Reginald Daly was the first geologist to introduce turbidity currents to the profession, Kuenen with his interesting tank experiments and his important field work, in which he showed examples of ancient turbidites, was certainly the scientist who demonstrated how important these currents have been in transporting coarse sediments into deep basins. Working with Manley Natland in the Ventura area of Southern California, with Migliorini in the Apennines, and with Carozzi in the Alps, he demonstrated the importance of turbidity currents in many ancient deposits. His experiments in tanks were very helpful in this work.

In 1934 Kuenen was given a new appointment in Groningen University where he had a very light teaching load, giving him a fine chance to conduct his research with emphasis on laboratory experiments. After the overrunning of Holland during 1940 by the German blitzkrieg, he was able to continue his career with some students coming from Leyden University, which the Germans had closed. He was supposed to become a professor at Groningen in 1943, but the Germans learned that his mother was English and stopped that promotion. He was finally given the professorship in 1946.

In his long career Kuenen had thrown light onto an amazing number of subjects. I note from a group of his reprints in my files that there are papers on the following

subjects: high speed turbidity currents, turbidites, experiments on turbidity currents, deep-sea sands, graded bedding, sole marks, load casts, submarine canyons, atolls, experiments on volcano origin, the genesis of ptygmatic folds, abrasion of cobbles, glacial control of sea level, water-faceted boulders, transport and source of marine pebbles, abrasion of sand grains, frosting of quartz sand, problems of meanders, origin of quartz silt, problems of epicontinental sediments, the undation theory, slump structures, and geosynclinal sedimentation. In the approximately 210 reprints that he has to his credit, there were certainly many others subjects covered and all of them apparently with original and thought-provoking ideas and many keen observations. In addition to his book *Marine Geology*, he published (in Dutch) *Crusades over the Indonesian Deep Sea Basins*, based on his letters written during the Snellius Expedition. Also his book *Realms of Water* was written in Dutch but translated into English. This is a very useful book covering water in its various forms—oceanic, atmospheric, frozen, ground-water, and surface. The book seems to have been given little attention and is rarely quoted, unlike most of Kuenen's other works.

Kuenen was honored by the societies of many nations. He was given the Penrose Medal of the Geological Society of America, the Shepard Medal of the Society of Economic Paleontologists and Mineralogists, the Wollaston Medal of the London Geological Society, and the Waterschoot van der Gract Medal of the Netherlands, and he was made an honorary member of societies in the United States, the Netherlands, England, Sweden, and Belgium. He was appointed "Knight in the Order of Netherlands Lion." He received honorary doctoral degrees from Dublin, Exeter, and Cracow Universities. Also he was a member of the Royal Netherlands Academy of Sciences.

With all of these honors, it seems amazing that he had to conduct a fight during his last active years to prevent the execution of a ruling made by the Netherlands Minister of Education and Sciences that would have abolished the School of Geology in Groningen University. His success in this fight caused a reversal of the ruling, but also may have caused Kuenen to have a nervous breakdown followed by a sad period of mental illness that terminated with his death. He had previously lost his beloved wife Loti who had been his devoted companion for many years.

His many friends will greatly miss Kuenen's stimulating presence at national and international scientific meetings. His friendly but critical discussions of many papers added immensely to the value of the meetings he attended.

SELECTED BIBLIOGRAPHY OF P. H. KUENEN

- 1933 The Snellius Expedition, Vol. 5, Pt. 2, Geology of coral reefs: Leyden, Holland, Brill, 125 p.
- 1935 The Snellius Expedition, Vol. 5, Pt. 1, Geological interpretation of the bathymetrical results: Leyden, Holland, Brill, 124 p.
- 1938 Submarine slopes of volcanoes and coral reefs in the East Indian Archipelago: C.R. Congr. Intern. Géogr. Amsterdam 1938, v. 2, p. 93-98.
- 1943 (and Neeb, G. A.) The Snellius Expedition, Vol. 5, Pt. 3, Bottom samples: Leyden, Holland, Brill, 268 p.
- 1950 (and Migliorini, C. I.) Turbidity currents as a cause of graded bedding: Jour. Geology, v. 58, p. 91-127.
- Marine Geology: New York, John Wiley & Sons, 551 p.
- 1951 Properties of turbidity currents of high density: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. No. 2, p. 14-33.
- 1953 Significant features of graded bedding: Am. Assoc. Petroleum Geologists Bull., v. 37, no. 5, p. 1044-1066.
- Origin and classification of submarine canyons: Geol. Soc. America Bull., v. 64, p. 1295-1314.
- 1955 Realms of water—Some aspects of its cyclic nature: New York, John Wiley & Sons, 327 p.
- 1957 Sole marking of graded graywacke beds: Jour. Geology, v. 65, no. 3, p. 231-258.
- 1958 Experiments in geology: Geol. Soc. Glasgow Trans., v. 23, p. 1-27.
- Some experiments on fluvial rounding: Koninkl. Nederlandse Akad. Wetensch. Proc., ser. B, v. 61, no. 1, p. 47-53.
- 1959 Turbidity currents a major factor in flysch deposition: Eclogae Geol. Helvetiae, v. 51, no. 3, p. 1009-1021.
- 1960 Experimental abrasion; 4, Eolian action: Jour. Geology, v. 68, no. 4, p. 427-449.
- 1964 The shell pavement below oceanic turbidites: Marine Geology, v. 2, p. 236-246.
- Deep-sea sands and ancient turbidites, in Bouma, A. H., and Brouwer, A., eds., Turbidites, developments in sedimentology-3: Amsterdam, Elsevier Pub., p. 3-33.
- 1965 Value of experiments in geology: Geologie en Mijnbouw, v. 44e, p. 22-36.
- Experiments in connection with turbidity currents and clay-suspensions, Colston Papers Vol. XVII, Colston Res. Soc. 17th Symposium, Proc.: London, Univ. Bristol, Butterworths Sci. Pub., p. 47-74.
- 1966 Matrix of turbidites—Experimental approach: Sedimentology, v. 7, p. 267-297.
- Geosynclinal sedimentation: Geol. Rundschau, v. 56, p. 1-19.
- 1967 Emplacement of flysch-type sand beds: Sedimentology, v. 9, p. 203-243.
- 1969 (and Humber, F. L.) grain size of turbidite ripples: Sedimentology, v. 13, p. 253-261.