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NOEL BRYAN SLATER

N.B.Slater was a distinguished member of one of the several remarkable groups of students who passed through the Mathematical Institute of Edinburgh University during its heroic age under E.T.Whittaker. Slater and his near contemporaries have displayed varied abilities that have led to eminence in public and academic life. Slater's particular talents lay in the scope of his intellectual interests and the depth of his scientific scholarship. He had a career of high distinction in mathematical research and teaching; it is only fair to his memory to record that he would undoubtedly have reached still greater heights had he not been assailed by ill-health just when he had most opportunity for the exercise of his powers.

Noel Bryan Slater was born in 1912 in Blackburn and was educated at schools in England and Scotland and then at the Universities of Edinburgh and Cambridge (Gonville and Caius College). He earned many honours as a student, and in 1939 he gained his Cambridge PhD degree for research in statistical mechanics supervised by R.H.Fowler. He then became an Observer in the Solar Physics Observatory, Cambridge, under F.J.M.Stratton, participating in a laborious visual patrol for solar flares. Slater might thus have made a profession of astronomy, but World War II supervened and he spent the war years in research in ballistics in the Projectile Development Establishment, Ministry of Supply. Immediately after that he went as a lecturer to the Department of Applied Mathematics in Leeds University; he remained there until 1961, being promoted to Reader in 1958. He served in succession under two distinguished Fellows of our Society, S.Brodetsky and T.G.Cowling; the arrival of Cowling delighted him, in particular, because of his early enthusiasm for Chapman and Cowling's *Mathematical theory of non-uniform gases* when it first appeared in 1939. Slater was for several years an effective secretary and then president of the Leeds Astronomical Society. He resumed work on the statistical mechanics (or kinetics) of unimolecular reactions, i.e. chemical changes in molecules that depend upon physical but not chemical interactions, a topic that had originally been suggested to him by Fowler. This earned him a considerable reputation, so that in 1955 he served as visiting professor of chemistry at Cornell University, where his lectures resulted in his well-known monograph *Theory of unimolecular reactions* (Cornell University Press and Methuen, London, 1959). In this general field, he edited the English version of the massive text V.N.Kondratev, *Chemical kinetics of gas reactions* (Pergamon, Oxford, 1964), and he learned Russian in order to

do this efficiently. In his last years he was developing an extensive research interest in the mathematical theory of queues.

In 1961, Slater was made Professor and Head of the Department of Applied Mathematics in Hull University. There he guided a notable expansion in the scope of his department, and he showed a warm human interest in his colleagues and students. He died suddenly on 1973 January 31.

One major episode in Slater's career is of special interest to astronomers because of its concern with the work of A.S.Eddington. When Eddington died in 1944 he left a finished draft of most of a book he had been writing, with brief notes of the intended contents of the rest. With characteristic generosity, E.T.Whittaker then supervised its publication; he chose the title *Fundamental theory* (Cambridge University Press, 1946).

Eddington clearly meant this work to supersede most of his previous writings on the foundations of physics; he made more ambitious claims to elucidate them than had ever been made by a responsible scientist. The presentation had a persuasive plausibility and it seemed poised to shed abundant light upon everything to do with the physical world. Eddington was an original mathematician of much power, and he appeared to derive his scheme of physics on the basis of a strict mathematical structure. Even to conceive the possibility of such a scheme stood out as a brilliant feat of intellect.

The trouble was that nobody could understand it! Some people could follow what Eddington claimed to have done, and some could follow his mathematics, but none could see how everything fitted together. However, such was Eddington's prestige, as well as his success in deriving apparently from nowhere uncannily accurate values for all known fundamental constants of physics, that many thought he must surely be right, if only they could grasp his arguments. (As regards one particular constant, in Eddington's time only Hubble's own value of about 560 km s^{-1} Mpc^{-1} for the Hubble constant was available; Eddington claimed to derive a theoretical value 572·36. In 1947 Slater reviewed the work and remarked that Eddington had overlooked a factor in his calculation that multiplied his value by 4/9. In 1952 Baade announced his observational correction of Hubble's value—by almost precisely this factor! Unhappily the Universe and Dr Sandage have spoiled the fun.)

This was where Slater came in. Sir Edmund Whittaker held him in high esteem and also knew of his interest in Eddington's ideas dating from pre-war contacts in Cambridge. So when it was found that Eddington had preserved much of the successive drafts of his book, and other unpublished fragments, Whittaker proposed that Slater

should examine everything to see what light it might cast upon the whole subject. It was a task of daunting proportions, but by superhuman effort Slater reduced his material to manageable size and to as much coherence as possible. The result was his book *The development and meaning of Eddington's 'Fundamental theory', including a compilation from Eddington's unpublished manuscripts* (Cambridge University Press, 1957).

As I inferred from contacts with Slater at the time, he had been inspired with the expectation that his intensive study of Eddington's work would lead to great insights into the secrets of nature. It was no fault of his that such was not the outcome. I think he convinced himself and his readers that Eddington had been carried along by his own intuition much beyond what was justified by his reasoning. Great as was Eddington's vision of the goals of physics, Slater's analysis made it almost certain that they would not be attained by exploiting Eddington's methods—somebody sometime would need to begin all over again. This was a deeply disappointing end to so much effort, but by so thoroughly exploring and airing the whole matter Slater had performed a major service to the scientific world.

Slater was devoted to his family and his friends. He was an accomplished musician and delighted in entertaining other people. He was elected FRAS in 1939 and FRSE in 1954.

I am grateful to colleagues who have given me so much information; unfortunately space does not allow me to use it all. A full account of Slater's work, with a complete bibliography, by his friend Professor D.G.Kendall, FRS, will appear in *Bull. Lond. Math. Soc.*, **6**, 1974.

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