R. W. Wood, Physicist

With the death of R. W. Wood, American physics has lost its most colorful figure. His passing away also underlines the end of a period in which individuals working with extremely simple means and practically unaided could make major contributions to their field. R. W. Wood was one of the chief exponents of this era.

The skeleton of his life's history can be told in a few words. He came from a prominent New England family and studied at Harvard University, where he received his bachelor's degree in 1891. He did not distinguish himself in those fields which were at that time believed to be the backbone of an education, but flashes of his originality and great gifts for the natural sciences became apparent at that time. He went as a graduate student of chemistry, first to Johns Hopkins University and then to the newly opened University of Chicago; after that he spent 2 years at the University of Berlin where, mostly under the influence of Rubens, he definitely changed from chemistry to physics. His first position was as instructor at the University of Wisconsin, which he held from 1897 to 1901. Here his flair for originality and inventiveness developed, and his name became so well known that, when Rowland died, Johns Hopkins University offered him the professorship of experimental physics as Rowland's successor, a post which he held from 1901 to his retirement in 1938, at which time he was appointed research professor of physics. He retained this appointment until his death.

In his chief field of endeavor, physical optics, Wood made many important contributions. The first 30 years of his work as a physicist coincide with the period when our knowledge of the structure of the atom gradually evolved and became more and more precise and detailed. Experiments in spectroscopy and other branches of physical optics were perhaps the chief sources for this knowledge. Wood's best known contributions were the line and continuous absorption of sodium vapor, fluorescence phenomena, particularly the discovery of the resonance radiation of gases and vapors and the influence of foreign gases and magnetic fields on such phenomena. With these discoveries he opened up a new field, which was taken up by many others during the second and third decades of this century. The subjects mentioned by no means even approximately indicate the versatility of his work. He made contributions in such diverse fields as x-rays, photography, meteorology, archeology, explosives, and acoustics. In fact, it almost became a standing joke that if anyone came along with a new discovery Wood pointed out that he had done the same thing 30 or 40 years earlier. The joke was that this was always found to be true.

Although this great variety of contributions makes it impossible to discuss any of them in detail, his success in perfecting the art of ruling diffraction gratings should be singled out, because this has benefited practically every physics laboratory and astronomical observatory in the world. The grating as a precision instrument was invented by Rowland. Wood inherited the machines designed by Rowland for ruling such gratings. He devised a number of improvements and, what is perhaps even more important, managed to keep the engines at work so that a constant stream of gratings came out of his laboratory. This was for many years almost the only source of supply for these very vital parts of a spectrograph. Since the use of spectrographs in science and industry had expanded tremendously with the years, this alone was a contribution of major importance.

Wood was by no means a worker in an ivory tower. He made many practical inventions and was greatly in demand by the military as scientific expert during the two World Wars and also in criminal and civil court cases. He acquired quite a reputation as a scientific detective; he himself and others could tell many anecdotes about his adventures in these fields. He also was a gifted painter and published a collection of nonsense verses (*How to Tell the Birds from the Flowers*) that went through more than 19 editions. He even tried his hand at science fiction.

His eminence as a physicist found wide recognition. Although in his youth he never could satisfy the conditions for a doctor's degree, he held many honorary degrees, among these doctor's degrees from Clark, Oxford, Birmingham, Edinburgh, Berlin, and Johns Hopkins universities. He was a member or honorary member of innumerable learned societies, among which were such ancient and illustrious ones as the Royal Society, the Accademia dei Lincei, the Leningrad Academy, and the Royal Swedish Academy. Of the many medals he received I mention only the Rumford medal of the Royal Society (1938), which is to be distinguished from the Rumford medal of the American Academy of Arts and Sciences which he had received 30 years earlier.

R. W. Wood was unquestionably a great physicist and a brilliant experimenter to whom science owes a great deal. The question of what makes a man great is always of interest. A man may become a great physicist because he possesses superb technical skill and can do experiments that are so difficult that they cannot be done by anyone else. This certainly was not true for Wood, because apparatus of even moderate complexity could leave him baffled. His success cannot be attributed to any particular insight into the mathematical intricacies of a problem, for even simple mathematical expressions could leave him helpless. Others do great things because they have the gift of organizing and creating great schools. Wood always was happiest when he worked by himself. He had, of course, manual skill, since he made most of his equipment himself, but the equipment he used was always simple and sometimes primitive. I believe that what was perhaps foremost in him was an intense curiosity that drove him to ask himself questions about the nature of things. He would then look at the problem from all sides until a simple approach presented itself to him. He never tired until he had solved the problem to his entire satisfaction and left no loopholes.

Wood in his later days had become a legend. Perhaps his life and work should be a warning to those who decide the fate of graduate students not to be bound by too rigid rules and to encourage youthful genius and originality, even if it is disdainful of strict rules and conventional book learning. Wood, with his disregard for traditional knowledge (which he often considered only an irksome encumbrance), probably would not be admitted by a graduate school now. Even in his day he did not qualify for a higher degree. The many honors he received later showed how wrong were the rules that barred him from it.

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