

**The Scientific Accomplishments of Professor B. Bleaney
(Introductory Award Address to the ISMAR Conference,
Chicago, 1983)**

**K.H. Hausser
Max-Planck-Institut
Abteilung für Molekulare Physik
Jahn-Strasse 29
6900 Heidelberg, West Germany**

All but one of the ISMAR Prizes given so far have been awarded for work in the field of NMR. The only exception was the third ISMAR Prize which was awarded posthumously in Banff in 1977 to Professor Zavoisky for the discovery of a resonance phenomenon of electronic spins, in fact, the first successful experiment of any magnetic resonance at all. However, Professor Zavoisky did not continue to work in this field and left it to others to explore and to elaborate this discovery. In this pioneering period such a large number of original contributions to the development of the technique of electron spin resonance (ESR) and its application in various fields of physics is due to Professor B. Bleaney that it is fair to say that he has really developed ESR to what it is today. Hence the task for the Prize Committee for the 1983 ISMAR Prize was easy: it decided unanimously to award the 1983 ISMAR Prize to him. May I read the wording of the award to you: "The International Society of Magnetic Resonance hereby confers to Professor B. Bleaney of Oxford, Great Britain, the International Society of Magnetic Resonance Award for the year 1983 in recognition of his pioneering work in developing Electron Spin Resonance and his many important contributions to its application to solid state physics."

Bleaney was born in London and went to school there and then to Oxford University where he took his B.A. in physics in 1937 and D. Phil. in 1939. In 1940 Bleaney became the youngest member of a group working for the British Admiralty in the Clarendon Laboratory

on centimeter waves. In 1941-2, in collaboration with J. H. E. Griffiths, he built small klystrons which were used as local oscillators in experimental radar systems at 3 cm wavelength. After the war the microwave tubes developed for radar gave an important tool to physicists. An early application was the analysis of the rotational structure of the inversion band of ammonia. This was done in 1945-6 with R. P. Penrose. With the same co-author, Penrose, Bleaney investigated the temperature dependence of the ESR of transition metal compounds down to 14 K. After Penrose discovered the hyperfine structure during a visit to Leiden, Bleaney, with a number of collaborators, made detailed studies of this very important phenomenon of ESR in salts of the iron, the lanthanide, and the actinide groups. This was the time of a very fruitful collaboration in Clarendon Laboratory with a group of theorists, including A. Abragam, M. H. L. Pryce, K. W. H. Stevens, and others who studied the theory of magnetic resonance.

Other important work of Bleaney concerned the study of exchange interactions of pairs of ions in semi-dilute salts by measuring the spin-spin interactions from the resonance spectrum. The first successful experiment was carried out in 1951 based on his proposal to use the local anisotropy of a paramagnetic ion as the mechanism for producing orientation.

Although I have concentrated in this very brief and sketchy review on Bleaney's contributions to ESR in the pioneering time in the late forties and in the fifties, he is still as active in research in physics today as he has

been all his adult life. His main field of interest in recent years has been the enhancement of nuclear magnetism in rare earth compounds. These investigations were carried out using nuclear magnetic resonance in collaboration with F. N. H. Robinson and M. R. Wells, and with experiments involving enhanced nuclear cooling and nuclear orientation together with N. J. Stone and his group. He has just given in the week

prior to the ISMAR meeting an invited paper at a conference in Denver and he came to Chicago not only for the ISMAR meeting, but also in the course of his collaboration with Professor Clyde Hutchison at the University of Chicago.

So let me conclude by extending to Professor Bleaney our congratulations and our best wishes for many more years of fruitful, successful, and rewarding work in scientific research.



Professor B. Bleaney
The Clarendon Laboratory
Oxford, United Kingdom

Recipient of the 1983 ISMAR Award