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This Week's Citation Classic®

Abragam A & Bleaney B. *Electron paramagnetic resonance of transitionions.* Oxford, England: Oxford University Press, 1970. 700 p. [Ecole Normale. Paris, France, and Clarendon Laboratory, University of Oxford. England]

This book covers both experimental and theoretical aspects of electron paramagnetic resonance, for the 3d, 4d, 5d, 4f, and 5f transition groups. It has remained the standard work on the subject for 20 years. [The *SCI*® indicates that this book has been cited in more than 3,160 publications.]

Electron Paramagnetic Resonance

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The first experiments on electron paramagnetic resonance in Oxford were made by Desmond M.S. Bagguley[1] in 1945 and extended to low temperatures by R.P. Penrose and myself[2] in 1947. Anatole Abragam came to Oxford in 1948 from Paris, and his doctoral thesis under Maurice Pryce developed the theory of magnetic resonance in the iron group.

In 1956-1957, while a visiting professor at Columbia University, New York, I started to write a book on the subject. I was far from satisfied with it, and it did not get very far. On my return as head of the Clarendon Laboratory in Oxford, I found student numbers had doubled after the end of the call-up for National Service. My main efforts were necessarily devoted to obtaining positions for new staff and new buildings for students and research.

By 1967, Abragam had recovered from the trauma of writing his classic treatise on nuclear magnetic resonance[3] and broached the idea of a joint book on electron spin resonance. His proposal was for a gigantic volume, including spin resonance studies of ions in semiconductors and at defect sites. This would have been far larger than the 700 pages that were published by the Oxford University Press in 1970.

As professor at the Ecole Normale in Paris, he gave a different set of lectures every year. (He complained that if he lectured on his own subject of magnetic resonance, the students were not interested, while if he lectured on one of their subjects, they knew much more about it than he did.) Nevertheless, he had ready sets of lecture notes covering the theory of electron paramagnetic resonance of transition ions. These formed the second part of our book, apart from a chapter on the Jahn-Teller effect that he added later, before I had finished writing the first part of experimental aspects. This division simplified collaboration between a pair of authors in different countries, especially as he wrote in English.

Our book was dedicated to John Hasbrouck Van Vleck, Nobel laureate in 1977, the doyen of the quantum theory of magnetism, with whom we had both been associated at Harvard University. Our book was later translated into both French (1971) and Russian (1972) editions, while a paperback version appeared in 1986 (Dover Publications Inc., New York). The subject of magnetic resonance and hyperfine interactions for lanthanide ions has been updated,[4] and a recent treatise on electron magnetic resonance[5] refers extensively to the book.

1. **Bagguley D M S & Griffiths J H E.** Paramagnetic resonance and magnetic energy levels in chrome alum. *Nature* 160:532-5, 1947.
2. **Bleaney B & Penrose R P.** Paramagnetic resonance at low temperatures in chromic alum. *Proc. Phys. Soc. London A* 60:395, 1948.
3. **Abragarm A.** *The principles of nuclear magnetism.* Oxford. England: Clarendon Press. 1961 599 p. (Cited 8.645 times.) [See also: **Abragam A.** Citation Classic. *Current Contents/Physical. Chemical & Earth Sciences* 22(30):18, 26 July 1982. Reprinted in: *Contemporary- classics in physical, chemical, and earth sciences.* (Thackray A. comp.) Philadelphia: ISI Press. 1986. p. 42.)
4. **Bleaney B.** Magnetic resonance spectroscopy and hyperfine interactions. (Gschneidner K A & Eyring L. eds.) *Handbook on the physics & chemistry of rare earths.* Amsterdam. The Netherlands: Elsevier. 1988. Vol. 11. 323-407.
5. **Pilbrow J R.** *Transition ion electron paramagnetic resonance.* Oxford. England: Oxford University Press. 1991. 736 p.

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