

SUPPLEMENT TO "CURRENT SCIENCE"

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SIR C. V. RAMAN AND CRYSTAL PHYSICS*

OPTICAL theory and the physics of crystals are linked together almost inseparably in the history of their development. It is not surprising, therefore, that his love of optics has led Sir C. V. Raman to take an ever-increasing interest in crystal physics, as will be evident from the titles of the papers communicated by him to the Academy during the past decade or two. Many aspects of the subject have received his attention at some time or another. More recently, also, he has considered the fundamental problems of crystal physics from a standpoint which, while it is essentially novel, has proved highly successful in explaining the facts of observation. In these circumstances, it has appeared desirable to include in the present Symposium on Crystal Physics which commemorates his Sixtieth Birthday, a classified list of the papers on the subject which have emerged from his laboratories during the last thirty years. It is of particular interest to trace the development of his ideas and to indicate the fundamental character of the contributions made by him and his school. This will be done in the present survey.

Some of the most beautiful illustrations of optical principles are to be found in the phenomena of crystal optics. Haidinger's and Quetelet's rings in crystalline plates, the iridescence of twinned crystals of potassium chlorate, the optical effects observed with amethystine quartz, the diffraction of light by the laminar boundaries in mica and the haloes observed in the Christiansen experiment with crystal powders are amongst the subjects of this kind investigated during the earliest years of Raman's professoriate by his pupils. The phenomena of conical refraction exhibited by biaxial crystals have also had a special fascination for him. Amongst the discoveries made in this field may be mentioned that of the formation of sharply focussed optical images by plane plates of biaxial crystals. That naphthalene crystals have an extremely large angle of conical refraction and exhibit the effects arising therefrom in a very striking way is another significant contribution. Many studies have also been published of the beautiful phenomena exhibited by the nacreous layer in molluscan shells and the manner in which they are influenced by the size, shape and relative orientation of the platelets of aragonite appearing in its stratifications.

2. THE SCATTERING OF LIGHT IN CRYSTALS

In the latter part of 1921, Raman commenced his studies on the diffusion of light in transparent media. These were systematically pursued over a period of years until finally they led to the discovery of the effect

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