DIAMONDS IN INDUSTRY

"DIAMOND Tools" was the subject of an interesting lecture by Sir C. V. Raman, Kt., F.R.S., N.L., in the Chemical Engineering Society of the Indian Institute of Science, Bangalore, on the 18th September 1948. Sir C. V. Raman referred at first to the numerous theoretical and experimental investigations on the subject of diamond, by himself and his collaborators, extending over a period of nearly 20 years and actuated only by the desire for fundamental knowledge. He remarked that his recent tour of the United Kingdom and the U.S.A. tended to confirm the views he had always had that an intensive study of the structure and properties of diamond would prove of the utmost importance not only for the pure branches of Science but for industry and technology as well; for, he said, industry especially in the U.S.A., has found uses already for diamond almost in its every department. He explained how for example diamond dust is utilised in the spectacle-making industry for cutting, grinding and polishing at a surprisingly fast rate; also, he described the use of diamond in the making of special high grade precision tools needed for shaping, in the manufacture of billiard balls, printing rollers, the burnishing of steel watches and so forth. He added that specimens of the crystal were utilised as dies, for drawing wires as thin as 10 μ after drilling through them an optically perfect hole of the required size and special shape with the aid of microscopes. He emphasised the fact that industry in U.S.A. has reached a stage when high class precision work demanded the use of diamond almost everywhere and moreover, found it worth while to employ high class material for the purpose.

He said that increasing demand for the utilisation of diamonds in industry did not in any way come to him as a surprise because, he said, mechanical properties of diamond, including especially its great hardness and compressive strength, warrant its extensive use in technology. Incidentally, he referred also to the vectorial variations in hardness which have come to light in the process of polishing the cubical, dodechahedral and octahedral faces of diamond and suggested an explanation of these variations in terms of its crystal structure.

PROF. BLACKETT AT BANGALORE

IN an interesting lecture on the Magnetism of Rotating Bodies delivered before the Physics Section of the Indian Institute of Science on the 24th August 1948, Prof. P. M. S. Blackett, F.R.S., the distinguished British scientist now on a visit to India, reviewed the latest position of the general theory proposed by him last year in regard to the magnetic field of massive rotating bodies.*

Introducing the subject, Prof. Blackett stated how for a long time it has been known, especially from the work of Schuster, Sutherland and H. A. Wilson, that the magnetic moment P and the angular momentum U of the earth and the sun are nearly proportional and that the constant of proportionality is nearly the square root of the gravitational constant G, divided by the velocity of light c. He said that when, for the first time, the magnetic field of a star, *78 virginis*, was measured by Babcock, the calculated value of its magnetic field agreed with its observed value, leading to a verification of the above relationship for the three bodies and covering a range of P and U of more than 10^{10} : 1, though only 2,000 : 1 in measured field. It was therefore considered that the above relationship pointed to some new and fundamental property of rotating matter.

Proceeding, the distinguished lecturer surveyed the various specific theories of earth's magnetism and remarked how recent investigations of Bullard and others favoured only the core theory. Their measurements of the earth's magnetic field down a mine 4,000 feet deep revealed an increase, though slight, in agreement with the core theory. But the magnitude of the increase was considered too small (though greater than marginal errors) to warrant any major conclusions. In this connection Prof. Blackett suggested that the problem of the earth's magnetism was of perennial interest and that it was "quite a serious proposition" for some one in India to carry out similar measurements in the Kolar Gold Fields, which he said, was the world's deepest mine, being nearly 9,000 feet deep.

In the course of his lecture, Prof. Blackett dealt also with the various factors such as the variability of the sun's magnetic field and others, that seemed to throw into doubt the fundamental nature of the relationship instituted by him between magnetic moment and angular momentum of rotating bodies.

*Vide *Nature*, 1947, **159**, 659.