

From a variety of sources the author has collected a considerable amount of information into a small compass, and the lay reader may rely upon finding sufficient information for his purpose concerning our indigenous medicinal and poisonous plants. That inaccuracies occur here and there must be admitted; they appear to be due to insufficient verification on the part of the author, and their presence is not surprising when one considers the number of conflicting statements that have been recently made on the subject. Should a second edition be called for, these might be avoided by submitting the proofs to an expert for critical revision, and blemishes thus be removed from a useful little work.

#### LETTERS TO THE EDITOR.

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#### The Colours of the Striæ in Mica.

ON examining even the most regularly split and transparent pieces of mica by diffuse reflected light, a few fine hair-like and rather irregular lines may generally be seen running along the surface. We have found that these lines or striæ show some very interesting effects when mica is examined in a Töpler "Schlieren" apparatus. The sheet as a whole, being optically good, remains invisible, but the striæ shine out as brilliant and vividly coloured lines of light, the colours being different for different striæ, and changing in a remarkable manner as the inclination of the mica relatively to the direction of the light in the apparatus is altered. For instance, a stria at normal incidence may appear crimson and, as the mica is rotated about an axis in its own plane, become successively purple, green, yellowish-green, yellow, orange, scarlet-red, green, yellow, and red.

The phenomenon is being investigated in detail by one of us (P. N. Ghosh), but as to its general nature there appears to be little doubt. The striæ are lines at which the thickness of the mica changes in a discontinuous manner, and the luminosity is due to the radiation from the discontinuity acting as a lamellar diffracting boundary. For any particular wave-length the radiation is zero if the retardation of the wave-front on either side of the discontinuity differs by an even multiple of half a wave-length, and is approximately a maximum if the difference is an odd multiple of half a wave-length. The detailed mathematical investigation would follow the general lines indicated by Lord Rayleigh in his theory of the Foucault "knife-edge" test (*Phil. Mag.*, February, 1917).

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PROBABLY the striæ, regarded by the authors as boundaries between regions of slightly different thicknesses, are the same lines as can be seen by reflections of soda light, as described in my note on "Regularity of Structure in Actual Crystals" (*Phil. Mag.*, vol. xix., p. 96, 1910). Doubtless the Foucault method shows them in a more striking manner, and, in any case, the colour effects are novel, so far as I know, and worthy of a closer examination.

RAYLEIGH.

#### SELF-CONTAINED MINE RESCUE APPARATUS.

MOST people are now more or less familiar with the development of the Army respirator from its crude form of a cloth pad to the scientific and efficient "box respirator" used to-day. This is just one example of the many applications and developments of science during the past few years. In mining work the need for the construction of apparatus on scientific lines is being more and more realised, and this is especially so in the case of mine rescue apparatus. When these are employed, whether for actual saving of life, for recovery work after some serious explosion, in dealing with mine fires, or for any other use in an irrespirable atmosphere, it is imperative that the apparatus should be so constructed that the wearer may absolutely rely upon it to last for the period and work required. In the past, unfortunately, too many different types of apparatus have been put on the market without undergoing a thorough and scientific testing, and as a consequence in several cases their use has been attended with fatal results.

The "box respirator" is designed to withdraw, or render innocuous, small quantities of highly toxic gases or vapours, thus leaving the air for the wearer to breathe practically harmless. Certain gases are, however, not readily absorbed by the ordinary form of Army respirator, and of these carbon monoxide is notable. The highly toxic action of small quantities of this gas mixed with air renders the use of an apparatus of the type of a self-contained mine rescue apparatus essential, and for certain classes of work at the Front, where dangerous quantities of carbon monoxide are met with, such apparatus has been largely employed.

The recent report of the Mine Rescue Apparatus Research Committee<sup>1</sup> should prove of interest, therefore, not only to the mining community, but also to many members of his Majesty's Forces. In May, 1917, the Advisory Council for Scientific and Industrial Research appointed Mr. W. Walker (Acting Chief Inspector of Mines), Dr. H. Briggs, and Dr. J. S. Haldane as a Committee "to inquire into the types of breathing apparatus used in coal mines, and by experiment to determine the advantages, limitations, and defects of the special types of apparatus, what improvements in them are possible, whether it is advisable that the types used in mines should be standardised, and to collect evidence bearing on these points."

Recent advance in our knowledge of the physiology of breathing, largely due to the work of Dr. Haldane, and the latter's practical tests on various types of mine rescue apparatus at Doncaster during the past few years, together with those carried out by Dr. Briggs (for the Research Committee) at Edinburgh, have given the Committee a sure foundation upon which to build its report.

<sup>1</sup> First Report of the Mine Rescue Apparatus Research Committee. (Published for the Department of Scientific and Industrial Research by H.M. Stationery Office.) Price 1s. 6d. The illustrations which accompany this article are reproduced from the Report by permission of the Controller of H.M. Stationery Office.