

## OUR BOOK SHELF.

*Die neuere Entwicklung der Kristallographie.* By Dr. H. Baumhauer. Pp. viii+184; 46 plates. (Brunswick: Vieweg and Son, 1905.) Price 4 marks.

THOUGH this sketch of the more recent developments of our knowledge of crystals will be of service to the crystallographic student, it is primarily intended for those physicists and chemists who require to make use of crystallographic methods in their own researches; detailed explanations of technical expressions and crystallographic ideas are therefore given.

The work is divided into six chapters. The first treats of the definition of a crystal, the law of zones, the law of rationality of indices, and the methods of crystallographic projection; an account is given of various fluid and viscous bodies which must now, according to the researches of Lehmann, Schenck, and others, be included in the same group with solid crystals. The second chapter shows that crystals may be distributed into thirty-two classes capable of reference to six systems, each class differing from the others in the elements of its symmetry. The third chapter explains the various methods by which the class of symmetry to which a crystal belongs may be ascertained, and thus treats of the determination of facial distribution by means of one-circle, two-circle, or three-circle goniometers, and the investigation of the physical or chemical properties, more especially optical anomalies, circular polarisation, pyroelectric behaviour, and the etch-figures developed on crystal faces as a result of solvent or chemical action; the last mentioned is a branch of crystal research to which Dr. Baumhauer has himself given much attention. The fourth chapter gives a discussion of the regular growths met with in crystals, and in this connection a detailed account is given of mimetic growths such as are observed in the case of the feldspars. In the fifth chapter is a description of the development of crystal faces; an account is given of Goldschmidt's "law of complication" and of nodal points. The sixth and last chapter deals with isomorphism, morphotropy, topical axes, polymorphs, and the relations between the chemical formula and the crystal system of a substance. The observations of Prof. Miers relative to the vicinal faces of alum crystals, and the researches of Dr. Tutton on the relation between the chemical composition and the morphological and physical properties of a substance are specially mentioned. Prof. Baumhauer's long experience as a teacher has enabled him to give an account which is at once well up to date and of a readable character.

*La Théorie moderne des Phénomènes physiques. Radio-activité, Ions, Electrons.* By Prof. Augusto Righi. Pp. iv+125. (Paris: L'Éclairage Électrique, 1906.)

THIS is a translation from the Italian. The book is a good semi-popular account of recent physical developments, and is likely to be useful to those desirous of gaining a first acquaintance with them. Even original investigators will here and there glean useful hints or ideas.

Prof. Righi, we are interested to note, prefers the use of an electroscope of almost microscopic dimensions for detecting minute radio-active effects. A systematic inquiry into the best dimensions for these instruments is very desirable, and might be advantageously made either from a mathematical or from an experimental standpoint.

In one or two cases Prof. Righi quotes investigations of which the soundness may perhaps be doubted—for instance, the alleged occurrence of radiations from phosphorescent zinc sulphide capable

of penetrating opaque bodies, and the determination of the velocity of Röntgen rays made by M. Blondlot. This last experiment depended on the action of the Röntgen tube on a minute electric spark. This action was afterwards attributed by M. Blondlot to the *n*-rays, and the objective existence of the *n*-rays is now generally discredited.

We have seen an English translation of Prof. Righi's book. The French translation is not, therefore, of special interest to English readers.

R. J. S.

*Modern Lightning Conductors.* By Killingworth Hedges. Pp. viii+119. (London: Crosby Lockwood and Son, 1905.) Price 6s. 6d. net.

THE subject of lightning protection is one of considerable importance to architects, and a book in which the existing information thereon is conveniently collated is therefore to be welcomed. Mr. Killingworth Hedges's long association with this very special branch of electrical engineering enables him to write with authority. The book may be regarded as a very useful work of reference on the subject, as it contains a summary of the recommendations of the lightning research committee of 1905, together with numerous extracts from the observers' reports on buildings which had been struck by lightning, which served as the basis on which the committee drew up its suggestions. These extracts are copiously illustrated and the faults in the details of the protection in each case are clearly pointed out. The book is enlivened by the last chapter, which gives several instances of peculiar results of lightning strokes.

## LETTERS TO THE EDITOR.

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## The Inventor of the Nicol Prism.

CAN any of your readers supply me with the dates of birth and death of William Nicol, the inventor of the Nicol prism? There is a tablet to his memory in the Wariston Cemetery, in Edinburgh, bearing an inscription drawn up by the late Prof. Tait. Strange as it may seem, though his fame is world-wide in optics, he is not even mentioned in the "Dictionary of National Biography," nor do I know of any memoir of him elsewhere.

SILVANUS P. THOMPSON.

Technical College, Finsbury, London, E.C., February 6.

## Result of War affected by Soldier's Stature.

THE Japanese had an unquestionable advantage in the recent war as being smaller than the Russians; they were smaller targets for fire-arms. I wish to point out that it is possible to express this advantage quantitatively on the assumption, justifiable in modern war, that bullets are, on the average, uniformly distributed over the target presented by a man's body, also that a man presents a target proportional in area to the square of his height. The Anthropological Institute has kindly given me figures for the purpose; the average height of 2500 Japanese, 1260 of them being soldiers, was 1585 millimetres as compared with an average of 1642 millimetres for the average of 177,948 European Russian conscripts. The average Russian height thus exceeds that of the Japanese by about 3.47 per cent. The squares of the two average heights, representing, as I have said, the average targets offered by each to an enemy, differ therefore approximately by 7 per cent., so that the Russian fire was relatively ineffective to that extent.

JOHN H. TWIGG.

The Hydro, Ben Rhydding, Yorkshire, February 1.