THE ORIGIN OF COAL.

Die Entstehung der Steinkohle und der Kaustobiolithe überhaupt. By Prof. H. Potonié. Fünfte Auflage. Pp. xi+225. (Berlin: Gebrüder Borntraeger, 1910.) Price 7.80 marks.

THE study of the probable mode of formation of coal and kindred substances has for many years engaged the attention of Prof. Potonié, who, as palæobotanist in the University of Berlin, and also as a member of the Geological Survey of Prussia, has had exceptional opportunity for such study, both in the cabinet and in the field. At the York meeting of the British Association in 1906, he laid before the Botanical Section his views on the origin of coal, and the following year issued the fourth edition of his little work, "Die Entstehung der Steinkohle, u.s.w."—an octavo of only forty-seven pages, which was briefly noticed in NATURE (vol. lxxviii., p. 86). In the new edition, recently published, the work has been considerably enlarged, and the title so modified as to indicate that it deals with the origin of caustobioliths generally.

Under this term *caustobioliths* are included all those rocks or mineral substances which are, directly or indirectly, of organic origin, and are combustible, whilst such organic rocks as are incombustible, like chalk, are distinguished as acaustobioliths. In order to explain the origin of the fossil deposits, the author has wisely given much attention to the corresponding recent formations, or what may be reasonably regarded as such. Three great groups of caustobioliths are recognised. In the first place, there are the rocks called *sapropelites,* formed from organic slime, or sapropel, resulting from the partial decay of aquatic organisms and their products in stagnant water. When the sapropel, in a sub-fossil state, becomes gelatinous, it is distinguished as saprocoll, whilst the Tertiary forms are described as saprodil, and the older varieties as sapanthracon. It is a disadvantage that the work is rather heavily weighted with an unfamiliar terminology, but it must be conceded that most of the terms are expressive, and in many cases undoubtedly convenient.

Cannel coal, boghead mineral and many so-called bituminous shales are regarded as sapropelites, whilst petroleum is considered by Prof. Potonié to be a product of the natural distillation of deep-seated sapropel rocks, which have been exposed to heat and pressure during processes of mountain-building.

Another great group of caustobioliths is formed by the humus rocks, which result from the accumulation of the remains of land-plants and bog-plants. This important class contains not only many brown coals, but our ordinary coals and anthracites. Whilst sapropel rocks, generally present a dull surface, or a silky lustre, and when heated yield much gas, the humus rocks, or at any rate those of Palæozoic age, are usually lustrous and yield a smaller proportion of gas. Coal which shows an alternation of bright and dull layers is regarded as a mixed caustobiolith, derived partly from humus, partly from sapropel.

To Prof. Potonié common coal is a rock which in most cases has been formed where it is now found, mainly by the fossilisation of deposits of peat, often in far-stretching swamps. Considering the modern tendency, especially in France, to regard most coal as a substance of allochthonous formation, it is interesting to find a distinguished specialist upholding the view of "growth in place," which until recently has been so much favoured in this country.

Peaty deposits, though not formed of transported material, may exhibit stratification, and humus matter may be partially dissolved in water and precipitated in layers. The coal-forming peat was probably in a pulpy condition. In certain cases, the author suggests that the appearance of stratification is explicable as the result of pressure acting in a direction at right angles to that of the lamination. Prof. Potonié holds that the flora of the coal measures indicates a tropical climate, and cites instances of the extensive growth of peat in tropical swamps, as in the fens of Sumatra, described by Dr. S. H. Koorders.

Distinct from both the sapropelites and the humus rocks is a small group of caustobioliths called *liptobioliths,* of which amber and pyropissite are examples. The liptobioliths consist chiefly of resinous and waxy substances, which by their resistance to decomposition are left after the decay of the other parts of the original organism.

Throughout the work the author gives numerous references to original authorities, but unfortunately in most cases without sufficient detail, the reference being usually limited to the name of the author and date of publication, such as "vergl. Uthemann, 1892." The student seeking further information would be grateful for a little more definite guidance.

F. W. R.

THE VOICE AND SINGING.

(1) *The Brain and the Voice in Speech and Song.* By Prof. F. W. Mott, F.R.S. Pp. xi+112. (London and New York: Harper and Brothers, 1910.) Price 2*s.* 6*d.* net.

(2) *The Abuse of the Singing and Speaking Voice: Causes, Effects, and Treatment.* By Prof. E. J. Moure and A. Bowyer, Fils. Translated by Macleod Yearsley. Pp. xi+130. (London: Kegan Paul, Trench, Trübner and Co., Ltd., 1910.) Price 2*s.* 6*d.* net.

(3) *The Voice. An Introduction to Practical Phonology.* By Dr. W. A. Aikin. Pp. ix+159. (London: Longmans, Green and Co., 1910.) Price 7*s.* 6*d.* net.

THERE are now many manuals dealing with the voice and with the management of the voice and singing. These are unequal in value, more especially as regards the description of the anatomy and physiology of the organs of voice and speech, and not unfrequently the writer strongly advocates a view peculiarly his own, and on which he founds his method of training. It is therefore of importance to have a description of the organs concerned in voice