

served circles I found a central or 'Gorsedd' stone, and in one case two central stones."

Mr. Bolitho's observations then intensify the purely local fashion of the Aberdeen circles.

One of the associated inquiries to which I have referred will be to trace the existence of recumbent stones in some part of Europe; another will be to see if the area of the recumbent stone has also special ethnological or craniological characteristics.

With regard to the first point, Anderson ("Stone Age," p. 124) tells us that in Norway and Sweden there is no example of a circle with a recumbent stone and supporters.

With regard to the second, the paper on British ethnology by Mr. J. Gray (*Man*, April, 1902) is full of promise.

A point worthy of notice is the great preponderance in the number of circles used to take the time at night over those enabling the seasonal changes and the sun's place throughout the year to be fixed. In Cornwall both were equally provided for.

We may, I think, include the circles with a north alignment with the clock-star circles as used to determine the time at night. They are respectively situated at Dyce, Whitehill Wood, Raes of Clune and Candle Hill (Insch). As before stated, they probably represent a later development when the observer's knowledge was so far advanced that he needed only the cardinal point in order to recognise the clock-stars which it was necessary for him to observe.

Judging by the trouble taken to determine time at night by the use of special circles in Aberdeen, religious services at fixed hours of the night are suggested to be as early as the time of the circle builders.

As these night observations were common to the two localities, we may conclude that in both, the circle associated with the *via sacra*, the chambered cairn, the holy well and the holy thorn, and the sacred festivals, represent the earlier form of the monastery buildings of later times.

I am anxious to conclude by expressing our deep obligations to many helpers. First of all to Dr. Fraser for his invitation to come and do some more work, his generous hospitality, and the use of his motor-car for the examination of the circles within a radius of twenty miles of the Granite City, some of which we saw under his own guidance. That is the first point; next comes the local help in four distinct regions—Inverurie, Durriss, Buchan and Insch. For the Inverurie district Mr. Ritchie, of Port Elphinstone, gave up two of his precious Saturday holidays, during which he piloted us to many circles which he had most carefully selected from a much larger number as being best worth examining.

At Durriss Mr. Braid and his son took us to the circles at Eslie and the Raes of Clune, and, further, had prepared a careful plan of the latter circle, thus fulfilling a promise made last year.

On our arrival at Mintlaw for the study of the Buchan circles, we found the Rev. Dr. Forrest, Mr. Ainslie, and his assistant, Mr. Gall, at the station, and with their help several circles near Mintlaw and Lomay were measured.

Later on we proceeded to Insch, and passed two nights in the comfortable Railway Hotel there. The obliging landlord, Mr. Haddon, had taken immense pains to secure local information. Colonel Smith, and Mr. J. Graham Callander who had only returned two days from studying Greek inscriptions in Asia Minor, accompanied us on each of the days, and with their help we were enabled to measure seven circles, some of them many miles from our headquarters.

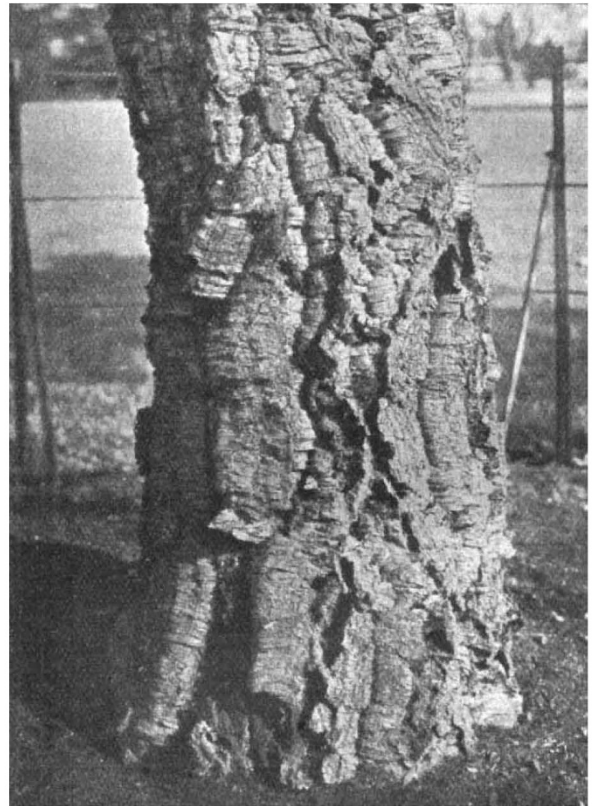
NORMAN LOCKYER.

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### TREES.

AMONG the many excellent books which have been written about trees there are none, in our opinion, better than the present work. It is full of interest from cover to cover. The many beautiful photographs of the different parts of trees are strikingly true to nature, and, having been taken from fresh material, they show the salient features of the different species much more clearly than could be observed from dried herbarium specimens. We have also beautiful portraits of the various trees themselves in summer and winter condition, as well as special plates illustrating the appearance of the bark. The accompanying illustration will speak for itself.

In his introduction Prof. Groom has given a very interesting and clear account of the various members, both vegetative and reproductive, which make up the body of the tree. The special function of each part



Bark of Cork Oak. Part of an illustration in "Trees and their Life histories."

and the influence of the environment on its activity is described in a way which the non-botanical reader should have no difficulty in following and thus laying a clear foundation for the better understanding of trees and their life-histories. It is difficult to say which part of the book is best, but in the introduction the author has broken new ground. A great fault in many similar works is that they contain a mere accumulation of facts, and dry, formal descriptions of different trees and their various parts, which the non-botanical reader may learn and thus get to know the various species by head mark. This is all very well so far as it goes, but surely it will make

<sup>1</sup> "Trees and their Life-histories." By Prof. P. Groom. Pp. xvi+407; illustrated from photos. by H. Irving. (London: Cassell and Co., Ltd., 1907.) Price 25s. net.

the study of trees much more intelligible and interesting when the meaning of structure and form is clearly and simply described to the student, as in the present work.

After this excellently written and beautifully illustrated introduction, the author takes up the gymnosperms. He does not attempt to deal with every known species, but certainly there are few which are likely to be met with in various pinetums, parks, and forests in this country which have not been dealt with. The life-history of each is clearly and well described and illustrated by photographs. As Prof. Groom states in his preface, "Particular trees have been selected for more detailed discussion, so as to serve as types by which to demonstrate certain structural features or general phenomena observable in tree-life." The study of the conifers appeals to a vast number of people, and a distinct gap in the existing literature has been filled by this work. No doubt other books give descriptions of the different species, but these are too condensed and technical to be of any use to the general reader. The broad-leaved trees are similarly dealt with in an interesting and masterly manner. Analytical tables and diagnosis of families have been added. These, together with the numerous illustrations and the special mention of distinctive features which is prefixed to the account of every tree described, will certainly ensure facility and accuracy in identifying the different kinds of trees with which the reader is likely to come in contact.

The author is to be congratulated upon the production of a work which should certainly be in the possession of all those interested directly or indirectly in trees and their growth.

A. W. B.

DR. JAMES BELL, C.B., F.R.S.

WE regret to have to announce the death, on March 31, in his eighty-fourth year, of Dr. James Bell, formerly principal of the Somerset House laboratory. Dr. Bell was a native of County Armagh, and entering the Inland Revenue Service became, when a comparatively young man, an assistant in the chemical department of Somerset House, then under the charge of Mr. George Phillips. This department, the forerunner of the present Government Laboratory, was the outcome of the Tobacco Act of 1842, and was created with the object of supplementing the provisions of that Act in suppressing the adulteration of tobacco. For his chemical education Dr. Bell was mainly indebted to the late Prof. Williamson. Indeed, in the early days of the Somerset House laboratory a close association existed between it and University College, and a number of the first assistants were trained in theoretical and practical chemistry in the Gower Street laboratories, and some of them, like Duffy, Kay and Railton, were encouraged by Dr. Williamson, then in the full vigour of his scientific activity, to try their prentice hands at original investigation. In the first years of its existence the laboratory, the staff of which consisted solely of Mr. Phillips himself, was almost exclusively engaged on the objects for which it was founded, but as its utility became more and more apparent its operations were gradually extended, and eventually embraced the examination of practically every excisable article. The laboratory at this period was also largely concerned with inquiries as to the brewing values of various materials, and on the methods of determining original gravities, and on the denaturing of spirits of wine so as to permit its use for manufacturing purposes without danger

to the revenue—all of which work found its application in subsequent Acts of Parliament.

On the death of Mr. Kay, Mr. Bell became deputy principal, and he continued in that office until the retirement of Mr. Phillips in 1874, when he succeeded to the principalship, holding that position until his resignation in 1894. During the fifty years of its existence the operations of the laboratory had greatly extended, and it had contracted associations with practically every Government department which had need of chemical advice and assistance, in addition to the large extension of its work connected with Revenue matters. Much of this development took place during Dr. Bell's principalship. But to the public at large Dr. Bell's tenure of the office was mainly signalled by the association of the Somerset House laboratory with what is in reality one of the least important of its many duties, viz. the Food and Drugs Acts. This popular misapprehension of the proper functions of the laboratory is no doubt due to occasional newspaper references to the fact that a disputed case of analysis of some food-stuff, drink or drug has been referred by magistrates to the Commissioners of Inland Revenue for the opinion of their chemical advisers. As a matter of history, this connection of the Somerset House laboratory with the Food and Drugs Acts occurred at the very time that Dr. Bell succeeded to the principalship, as a result of a report of a Select Committee of the House of Commons on the working of the Act of 1872, and this circumstance caused the laboratory to be known to the public at large to a much greater extent than formerly.

The new responsibility thus thrown on Dr. Bell involved a very considerable increase of work on the department, not so much in actual analysis of referred samples as in investigations into the methods of food analysis in general and in the establishment of standards of quality. Thirty years ago the methods of food analysis were, for the most part, in a very unsatisfactory condition. The great teachers of chemical analysis, Berzelius, Rose, Wöhler, Thomson, Bunsen, Fresenius, and the men trained in their schools, were mainly concerned in the discovery and elaboration of the methods of mineral analysis, and very little attention had been paid to processes for the systematic examination of food with a view to the determination of its quality or to the detection of adulteration. The first Food and Drugs Act was largely ineffective owing to this circumstance. When the office of a public analyst was first created, practically each analyst had to devise his own methods, and at the outset no uniformity or agreement was possible. The condition of things to which this gave rise, with the consequent frequent instances of injustice, was indeed the cause of the appointment of the Select Committee above referred to.

As regards methods of analysis, Dr. Bell, as the referee eventually appointed under the Act of 1875, was in no better position than other analysts who held office under the Act, and he at once turned all the force and ability of his laboratory to the elaboration of the methods for the examination of such articles of food and drink as experience showed most frequently came within the purview of the Act. In this work he was assisted by some of the most competent analysts the laboratory ever possessed, notably Mr. George Lewin, the late Mr. Harkness, the late Mr. John Holmes, and Mr. Cameron, each of whom did yeoman service in getting together the material embodied in the work by which Dr. Bell is best known, viz. his "Chemistry of Foods." It was mainly in recognition of the service thus rendered to the community that Dr. Bell was elected into