

of a Nilghai can see at once how the spike-like horns spring straight upward, bending slightly forward, and how the near horn hides its fellow.

The knowledge of this animal would undoubtedly have reached the ancient Persian civilization from the trans-Indus region, and the artists of the period would very naturally have graven but a single horn in bas-relief profile. Further evidence that this animal was known to the ancient Persians is to be found in the name itself—"Nilghai," or "Nylghau," being of Persian origin and meaning "blue bull." The species first became known to the modern world of Western Europe about 1745, and was described and figured in *Philosophical Transactions* for that year by Dr. Parsons, in a paper entitled "An Account of a Quadruped brought from Bengal, and now to be seen in London." In *Philosophical Transactions* for 1770 Dr. William Hunter published a very full account of this animal from living specimens brought to England, and bestowed upon it the native name "Nylghau."

As the unicorn of Otesias failed to materialize in the fauna of any country, it was relegated to the land of fabulous creatures, and became conventionalized in the art of the ancient and medieval world. If, as Mr. Eastman points out, its origin is to be found in the bas-reliefs on the walls of Persepolis, then, undoubtedly, it must have been a figure from some living prototype, and this prototype could, it seems to me, be none other than the Nilghai, the only Asiatic ruminant with horns so placed as to give rise to such a conception.

SPENCER TROTTER

SWARTHMORE COLLEGE

#### SCIENTIFIC BOOKS

*A Manual of the North American Gymnosperms*, exclusive of the Cycadales, but together with certain exotic species. By DAVID PEARCE PENHALLOW, D.Sc., MacDonald Professor of Botany, McGill University, 8vo, pp. viii + 374, with 48 text illustrations and 55 plates. Boston, Ginn & Company, The Athenæum Press. 1907.

The book is prepared for "working botanists," "engineers, and especially foresters." For the latter the author hopes that his histological diagnoses may be of great value in the difficult task of identifying the various species of coniferous woods in the absence of the usual botanical data. The author tells us that

The present work had its origin in 1880 in an attempt to construct a system of classification for the North American Coniferae based upon the anatomy of the vascular cylinder of the mature stem. The fundamental idea was that such a classification would prove of great value in the identification of material used for structural purposes, but investigations had not been carried very far when it became manifest that some such arrangement was imperatively demanded in other directions and for purposes of a more strictly scientific character.

The author here refers to the value of such data in the study of fossil plants.

The book is divided into two parts, the first, devoted to the general anatomy of the conifers, covering half of the volume. In this the reader or student finds very useful general directions for the preparation of material, discussions of growth-rings, tracheids, bordered pits, medullary rays, wood parenchyma, resin passages, etc. In part second the author arranges and describes the genera and species of North American Gymnosperms (exclusive of Cycadales) under three orders, viz., Cordaitales (including the extinct *Cordaites*, and the surviving *Dammara*, and *Araucaria*), Ginkgoales (including the surviving *Ginkgo*) and Coniferales (including seventeen genera of surviving or recent gymnosperms). Here we have the species of each genus separated by means of a convenient key. Then we have the species arranged systematically, and in each case the scientific name is first given, with a citation of the authority. Next follows a paragraph descriptive of the transverse section, a second for the radial section, a third for the tangential section. For extinct species the mode of fossilization and the geological position are given, while for living species data are given as to specific gravity, fuel value, strength, etc., and geographical distribution.

An appendix in which the anatomical characters are brought together for easy comparison, a list of the literature cited, and a good index close the text, following which are the plates, all excellent half-tone reproductions of photomicrographs of wood sections.

In the chapter on general phylogeny the author gives us his ideas as to the phylogeny of the Coniferales in a suggestive diagram (page 161). Proceeding from the main stem of the Cycadofilices are two considerable branches the Cycadales (including *Bennettitaceae* and *Cycadaceae*), while the other through *Poroxylon* soon subdivides into Cordaitales (*Cordaitea*, *Dammara*, *Walchia* and *Araucaria*), Ginkgoales and Coniferales. In the latter *Taxaceae* and *Podocarpaceae* constitute a primitive side line: later we find *Taxodineae*, then as another side line *Cupressineae*, while the main line terminates in the close group, *Abies*, *Tsuga*, *Pseudotsuga*, *Picea*, *Larix*, *Pityoxylon*, *Pinus*. The last-named genus is regarded as the highest differentiation of the Coniferales.

CHARLES E. BESSEY

THE UNIVERSITY OF NEBRASKA

*Royal Society of London Catalogue of Scientific Papers, 1800-1900.* Subject Index, volume I., Pure Mathematics, Cambridge; at the University Press. 1908. Pp. lviii + 666.

This is the first volume of a subject index, which is to be published as "separate index-volumes for each of the seventeen sciences of the schedule of the International Catalogue, viz., mathematics, mechanics, physics, chemistry, astronomy, meteorology, mineralogy, geology, geography, paleontology, biology, botany, zoology, anatomy, anthropology, physiology and bacteriology." This index will complement the great Catalogue of Authors which is being issued by the same society and of which twelve large volumes (1800-1883) have been published, while the volumes covering the period from 1884 to 1900, inclusive, are in preparation. These two catalogues will have close contact with the "International Catalogue of Scientific Literature" which contains an author and a subject catalogue of the sci-

entific publications beginning with 1901. The present work is arranged in accordance with the schedules of the different sciences which form the basis of the International Catalogue.

The preparation of a complete subject index of the scientific papers published during the nineteenth century is an enormous undertaking which can, however, be well justified by the usefulness of such a work when completed. The volume before us is said to contain 38,748 entries referring to 700 serials. While these numbers may appear large, yet they are too small for a complete index of the mathematical papers appearing during the nineteenth century, and it is not difficult to point out omissions. In fact, a number of fairly well-known mathematical periodicals were overlooked altogether, and a complete list of mathematical papers would have demanded reference to about 1,100 periodicals instead of to 700. As instances of omitted periodicals we may mention, *Zeitschrift für mathematischen und naturwissenschaftlichen Unterricht* and the *American Mathematical Monthly*.

Although the volume under review exhibits clear evidences of incompleteness, it contains such a large amount of information in a convenient form that it is difficult to see how a live mathematician can afford to get along without it, especially since there is no other work in existence which can take its place. By limiting itself to periodic literature, it complements Wölffing's "Mathematischer Bücherschatz" (1903), which aims to give a complete list of the most important mathematical text-books and monographs published during the nineteenth century. Unfortunately, Wölffing's work, arranged under 313 headings, is still less complete than the one under review, and presents numerous other evidences of hasty preparation.

A very commendable feature of this great bibliographical undertaking of the Royal Society is that it tends to make it easier to keep in touch with the advances that are being made in several great subjects of scientific inquiry. If the volumes devoted to the various subjects are parts of the same set and are arranged according to the same gen-