

ducing a non-scientific volume, which is embellished with fifty-four plates, fifty-three of which are coloured, and contains a full and useful introduction. With this, among the many other popular works on natural history recently published, we may look forward to a prospective time, when the general reading public, and lovers of animal life, will be sufficiently acquainted with the main aspects of general zoology as to enable them better to grasp the real import of the many conclusions and theories—philosophical and otherwise—which have followed the great Darwinian conception. It may also be hoped that the narrative of life-histories of insects, now so frequently detailed and so easily consulted, may incite a further cultivation of economic entomology, a subject in which our American cousins still hold the field.

Grandeurs Géométriques. By J. Pionchon. Pp. 128. (Paris: Gauthier-Villars, 1903.) Price 3.50 francs.

EXPERIENCE in the teaching of young engineers at Grenoble has induced Prof. Pionchon to undertake the task of publishing some seventy little volumes presenting in a clear outline the fundamental notions, theoretical and practical, which should form the basis for further study. The collection includes sections on mathematics, mechanics, physics, electricity, and economics, and the present volume is the fourth of the first section. It explains in an elementary way the nature of the different geometrical entities and the methods by which they are measured. There is no attempt to dip beneath the surface and introduce any of the philosophy of the subject, but some passages in smaller print give rather more advanced considerations and analytical formulæ without proof.

If the book stood alone it could perhaps be passed without comment, but the prospect of seventy others of the same kind compels a word of criticism. It must be admitted that the contents appear to be perfectly sound, but beyond this we have little praise to bestow. Whatever it contains of value ought to be in the notebook of every engineering student who has had the minimum necessary instruction in mathematics, and if it is not already there, the reading of this volume will only lead to that undesirable sort of knowledge which too often forms the main part of the mathematical equipment of engineers, and is unfortunately encouraged by some of their teachers. The appearance of the pages suggests that they are designed to compensate physical as well as intellectual myopia, and this emphasises the inanity of many of the propositions. The author must be singularly devoid of the sense of humour. R. W. H. T. H.

LETTERS TO THE EDITOR.

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Secondary Radiation produced by Radium Rays.

I LATELY had occasion to produce some radium radiographs of two partially overlapping pennies contained in a paper envelope which was laid directly upon the photographic plate. A print from one of the results shows that the shadow of the upper coin is blurred and diminished where the rays pass through air from the edge of this coin to the plate, but that it is sharp and of the correct size where the rays pass to the plate through the lower coin. This seems to point to the production of a considerable secondary radiation by the rays in their passage through air. L. R. WILBERFORCE.

University of Liverpool, December 22.

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An Interesting Yucca.

IT frequently happens that facts of much general interest are published in systematic monographs and other taxonomic works, and are in consequence overlooked by many of those to whom they would be most valuable. Turning over the pages of the revision of the Liliaceous group Yuccæ, published with superb illustrations in the 1902 report of the Missouri Botanical Garden, I came across some statements which seem to deserve wider circulation and comment. The whole of the work referred to, by Dr. Wm. Trelease, is exceptionally well worth reading on account of the extremely lucid presentation of the facts, but the statements which especially interested me are as follows:—

The subgenus *Chænoyucca* contains thirteen species, some of which have the style green while others have it white. *Yucca glauca* is the very common narrow-leaved green-styled species of Colorado and northern New Mexico, extending to South Dakota and central Kansas. The inflorescence is simple, or with an occasional branch. *Yucca constricta* is a white-styled species, very similar to *Y. glauca*, found from the Pecos River region of Texas to Seward County, Kansas, where it meets the range of *Y. glauca*. It has the inflorescence rather amply branched at the top. A few years ago Mr. James Gurney, head gardener of the Missouri Botanical Garden, "was struck with the variety of foliage and difference of vigour of growth" shown by the Yuccas of Seward County, Kansas, all being ostensibly *Y. glauca*. He collected a considerable number of these plants to show the differences, and they were transferred to the Missouri Garden, where some of them have bloomed. Among them was one which had practically the foliage of *Y. glauca*, but it produced "a rather ample long-pedunculate panicle of pure white flowers, with white styles," which began to expand at the end of the flowering period of *Y. glauca*. This specimen was by no means to be separated from *Y. constricta*. Other specimens exhibited the normal flowers of *Y. glauca*, and still others had flowers like those of *glauca*, but with a conspicuously branched inflorescence. This last form agrees with the long-lost *Yucca stricta* of Sims, but is placed by Dr. Trelease as a variety of *Y. glauca*. In addition to these differences in the flowers, the foliage varied in breadth and flexibility.

No suggestion is made by the author that the phenomena described are the result of hybridisation, but it is well known that Yuccas are frequently crossed in cultivation, and Dr. Trelease presents an extended discussion of Yucca hybridisation in another part of his paper. In the case of the Seward County plants, we have an unexpected and great mutability developing locally in an ordinarily stable species of wide distribution; and is it not suggestive, to say the least, that this should occur just where the ranges of *Y. glauca* and *Y. constricta* overlap, and that the so-called *stricta* should have more or less intermediate characters taken as a whole, while the features taken separately are nevertheless pure? May this not be a case conforming with the Mendelian laws? In any event, it seems well worth consideration, for the mutability has to be explained somehow or other, that is to say, there must be a reason for it.

Granting the supposed hybrid origin of *Y. stricta*, the case is curiously parallel to that of the perplexing woodpeckers of the genus *Colaptes* inhabiting the same region, which are intermediate between the eastern yellow-shafted and western red-shafted species.

The only other Yucca which could be involved in the above discussion is the green-styled *Yucca mollis* (*Y. angustifolia mollis*, Engelmann, 1873),¹ but this is not known to extend so far west as to meet the range of *Y. glauca*.

T. D. A. COCKERELL.

Colorado Springs, Colorado, U.S.A., December 13.

¹ Dr. Trelease names this *Y. arkansana*, "in deference to the prevalent American practice in nomenclature," whereby *mollis* is held untenable because of Carrière's prior *Y. gloriosa mollis*, applied to a garden form. A practice which permits a name proposed for a garden variety of a different species to stand in the way of an otherwise valid specific name should surely be condemned.