Genesis, that the lights in the firmament of heaven were to be for signs.

It is altogether probable that entomologists, before entering upon the course here marked out for them, will demand a better statement of guiding principles, and a better disposition of the ontogenetic and phylogenetic difficulties that beset the way.

JAMES G. NEEDHAM

Minerals and How They Occur. By W. G. MILLER, Provincial Geologist of Ontario, formerly Professor of Geology, School of Mining, Queen's University. Toronto: The Copp, Clark Company. 1906.

In his intention of producing a book on mineralogy for 'secondary schools and prospectors' the author has succeeded admirably both because of the clearness and simplicity of his style and because of his accuracy of statement. There is room for books of this sort since, though the subject is of wide general interest, there are few sources of information which are attractive to the *beginner*. The average book offered to the beginner is not only inaccurate but lacks successful arrangement and shows poverty of facts and illustrations. Professor Miller's book contains about two hundred illustrations and these give such an idea of the subject as descriptions could not convey. They are new, well selected, and some of them are especially good (*e. g.*, Figs. 20, 47, 63, 79).

The large amount of information contained in the book is in attractive form. Upon looking at the table of contents one might be reminded of Voltaire's essay on dogs in which towards the close he says 'Speaking of dogs reminds me of cats' and proceeds to write a short dissertation on cats. One might think that the paragraphs on fossils were hardly called for a book on mineralogy. But as he becomes acquainted with the author's aim he sees that the book differs from the ordinary one which presents the science in its narrower aspects and that it has been written just as if the author were talking to interested beginners before whom he must needs start with the most obvious things—rocks, the common rocks with which his readers are familiar—and build upon them his edifice. Such work necessitates excursions into the surrounding country and the result is a building all of whose parts contribute to mineralogy.

The more involved parts of the subject are omitted or touched upon but lightly and the things which are apt to prove most attractive to beginners are presented in logical and compact manner.

A few changes might be suggested. Though crystallography is the least palatable side of the subject it is so essential as to require more attention. When the axes of the six systems are being given (Fig. 23) one should not be omitted; the orientation should be according to the almost universal method—*i. e.*, a should always be the axis pointing to the observer, should always represent the short axis in the orthorhombic and triclinic systems, and the inclined axis in the monoclinic system. β should represent the acute angle made by the intersection of c and a and a by the intersection of c and b. All of the simple holohedral forms should be pictured and with the axes drawn in them. Whether combination, twinned and hemihedral forms are presented may well depend on the space at the disposal of the author. But if crystallography is to be mentioned at all the first principles should be given with clearness.

An occasional statement like the following should be modified. "During late years this theory of origin (of petroleum and natural gas) has been questioned by many workers who are inclined to believe that both materials are of inorganic origin" (p. 59). Forty years ago Berthelot suggested that petroleum might have originated from union of carbonated waters with uncombined sodium and potassium and about ten years after that Mendeleef propounded as a possible origin the union of such waters with metallic carbides. Thus the theory can hardly be called a recent one and in addition it appears to be a theory which shows possibilities rather than the facts which the study of oil fields the world over seems to establish. The actual geological conditions in oil fields necessitate the conclusion that oil and natural gas are of organic origin.

The book is full of valuable information

presented in attractive form and for the beginner is one of the best books of its kind with which I am acquainted.

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SCIENTIFIC JOURNALS AND ARTICLES

The Journal of Experimental Zoology, Volume III., No. 4 (December, 1906), contains the following papers: 'The Physiology of Regeneration,' by T. H. Morgan. Experiments on salamanders, earthworms and fish show that the rate of regeneration in a posterior direction is more rapid the further the cut surface from the original end. In other words, the more of the old part removed, the more rapid the new part regenerates. Other experiments show that this is not due to food conditions, but that the rate depends on a formative factor. It is suggested that it is the relation of tension in the old and the new part that is a controlling factor in regeneration and growth. 'Hydranth Formation and Polarity in Tubularia,' by T. H. Morgan. Experiments on tubularia show that the polarity is an expression of the direction of the gradation of the differentiated materials. The greater the differentiation in one direction the longer the road that must be traveled to produce a different kind of structure. The gradation acts as a physical factor in development, determining the tension relations in the old and new part. 'Studies on the Development of the Star-fish Egg,' by D. H. Tennent and M. J. Hogue. This paper describes the parthenogenetic development of the star-fish egg following treatment with CO_2, the phenomena occurring as a result of first treating the egg with CO_2 and later fertilizing it, and the results of subjecting fertilized eggs to the influence of CO_2. 'Some Experiments on the Developing Ear Vesicle of the Tadpole with Relation to Equilibration,' by Geo. L. Streeter. A study of the normal development of the function of equilibration in the tadpole, and the variations produced by removal and transplantation of the ear vesicle during the early larval period. 'The Relation between Functional Regulation and Form Regulation,' by C. M. Child. The organism is to be regarded as primarily a dynamic or functional complex, and structure and form are visible expressions of dynamic conditions: consequently the regulation of form and structure is fundamentally a dynamic or functional regulation and only as such can its phenomena be satisfactorily interpreted. 'Study of the Spermatogenesis of Coptocycla Aurichalcea and Coptocycla Guttata, with especial reference to the Problem of Sex Determination,' by W. N. Nowlin. An investigation of two species of beetles revealed the presence of an unequal pair of chromosomes, the so-called 'idiochromosomes' of Wilson, which, we have strong evidence for believing, transmit or determine the character of sex. The small one invariably occurs in the male somatic cells and represents the recessive form of the female character; the large one in the female somatic cells and bears the male character. 'Torsion and Other Transitional Phenomena in the Regeneration of the Cheliped of the Lobster (*Homarus Americanus*),' by Victor E. Emmel. A comparison of the regenerative with the ontogenetic method of development. 'The Influences of Gases and Temperature on the Cardiac and Respiratory Movements in the Grasshopper,' by Eulalia V. Walling. The influences of gases and temperature on the respiratory and cardiac activities were found to be practically the same on segments of the isolated heart and isolated respiratory centers as in the normal grasshopper. Moreover, it was found that these activities may continue in such specimens as long as four days in an atmosphere of pure hydrogen.

DISCUSSION AND CORRESPONDENCE

NORTON'S ELEMENTS OF GEOLOGY

The review of Norton's 'Elements of Geology,' which appears in a recent number of Science, Vol. 24, p. 590, prompts one to repeat the suggestion recently made, that the legitimate function of a review in such a periodical as Science is to give to the reader an accurate impression of the general character of the work, both as to the ground which