## THE THREE KINGDOMS OF NATURE

*The Three Kingdoms of Nature, briefly described.* By the Rev. S. Haughton, F.R.S., M.D. Dubl., D.C.L. Oxon, &c. (London: Cassell, Petter, and Galpin.)

THIS little work resembles a modern novel in one particular: it is written with an idea.

The learned author, in his preface, lays down the law that "the faculties of our mind are developed in succession as we advance in age, each of them reaching its maximum and then gradually diminishing. In childhood the senses acquire their greatest development; in boyhood and youth, the memory and imagination; in early manhood, the purely reasoning faculties; and in adult life, the judgment." He accordingly draws the conclusion that "the child should be instructed mainly through his sensations; the boy should learn languages, ancient and modern, and natural history, so far as it depends on observation; the youth should cultivate mathematics and logic; while studies such as ethics, physiology, and politics should be reserved for the more mature period of life:" and offers this work as a text-book on Natural History.

We must confess that the above law seems to us to be barely a half-truth. We admit that the senses are relatively strongest in childhood, but not absolutely. So far from their attaining their maximum development at that age, and then gradually diminishing, we believe that the senses of the truly fashioned man are at their height when he is in the prime of life; and that in the properly trained man, memory, imagination, reason, and judgment, all flourish at the same time.

We are apt to forget into what a wretchedly cramped and artificial condition so many generations of schoolmasters have bred us. Each of us, generation after generation, has very early been made to put Chinese shoes on most of the feet of his mind.

We all see the sportive, elastic, quick, sharp, unwearying work of the senses of a little child. We do not all of us bear in mind to how fearful an extent those senses are bruised and deadened by the pedantry of our pedagogues. Men who cultivate those sciences in which success is inseparable from agile sense, know at what cost and labour, in later life, sometimes even in their full prime, they have had to go back and undo all that their schoolmasters have done, have had to become little children again for the sake of a sharper eye and a quicker ear. To ourselves, there is nothing more disheartening than to study a little boy, of eight or ten years of age, who has never been to school, tracing out in his mind with ease nascent scientific capabilities; then to know the same little boy after he has enjoyed for two or three years the great advantages of a grammar or a commercial school, or a private academy, and to find his mind as blank and as deadened as his moral nature.

We do not feel inclined, then, to accept the physiological law laid down by Dr. Haughton, but we are not thereby prevented from agreeing with him that "Natural History (as a school study) is inferior to no other study, not even language, as a means of cultivating the memory and observation," or from accepting his brief description of the three kingdoms as a capital instrument of teaching.

The first part contains, besides an introductory and extremely lucid chapter on Crystallography, a detailed but succinct description of the various minerals found in Nature; the chemical composition, physical characters, crystalline forms, geological and geographical distribution of each being briefly given.

The second part treats of the Vegetable kingdom; dealing somewhat fully with the anatomy, more briefly with the physiology, of plants, and devoting only some dozen pages or so to classification.

The third part, comprising nearly half the volume, describes the Animal kingdom, beginning with mammalia and working down to protozoans. In each subdivision a brief anatomical history precedes the classification, which is given pretty fully. Formal definitions in italics, of classes and orders, are relieved by popular descriptions of the habits and features of species and individuals; and the whole work is largely illustrated by many excellent woodcuts.

Although so large a field is gone over, the matter is on the whole eminently exact and truthful; and the author has probably given an indication of the judgment of the mature period, by hesitating to place in a dogmatic text-book views on various points which are certainly recent, and may turn out to be raw. We may congratulate Dr. Haughton on having compressed a vast amount of information into a small compass. But is only right to add one more observation: the book is very formal, even to exceeding toughness. Though quotations from the poets, Aristotle, and Scripture appear here and there, the general reader would, we fear, find it very dry. As a text-book in the hands of a teacher, it will commend itself to every one; we doubt if any but very strong-minded persons would choose it for self-instruction, except with the fear of an examination before them. M. F.

## OUR BOOK SHELF

**Baillon's Cæsalpineæ.**—*Histoire des Plantes:—Monographie des Legumineuses Cæsalpinées.* Par H. Baillon. (Paris: Hachette, 1869. London: Williams and Norgate.)

WE have so recently reviewed the first volume of Baillon's "History of Plants" (see NATURE, No 2, p. 52) and discussed his mode of treating the subject, that we need scarcely more than mention the publication of his monograph of the important order or sub-order of *Cæsalpineæ*. The boundary-line between this sub-order and the *Papilionaceæ* is very difficult to be accurately laid down. M. Baillon describes the *Cæsalpineæ* to be, in general terms, those *Leguminosæ* which have a straight embryo and the æstivation not vexillary in the bud; but neither of these diagnostics can be relied on as absolutely constant. All the other characters dependent on the regularity or irregularity of the corolla, the cohesion of the stamens, the number of seeds, the presence or absence of albumen, &c., are still more uncertain. There are even species so far removed from the normal type of the order as to have undivided leaves, indefinite stamens, diclinous flowers, and herbaceous stems. A. W. B.

*Ueber die Fortpflanzungs-Geschwindigkeit des Schalles in Rohren.* Von Adolf Seebeck. (Göttingen, 1869.)

IN this inaugural dissertation, Herr A. Seebeck, the inheritor of a name famous in physical science, gives an account of his experiments on the velocity of the propagation of sound in pipes. The results are extremely interesting and important.

In 1867, Professor Kundt, of Zurich, proved that the velocity of sound in pipes depends on their cross section, and attributed the result to the loss of heat in the friction