on zoölogy and a child's picture-book of animals. The chapters are divided into short, numbered paragraphs, each headed with a full-faced subtitle, in the style of a school 'reader.' This, and the rather pedagogical style, render it nearly certain that young people will not *read* it; while the necessary sketchiness of its contents, and the innumerable omissions, render it nearly useless as a book of reference. It may have some value in the hands of a teacher as suggesting a series of topics for elaboration, but, even so, we are confident that the patient examination of half a dozen typical specimens would furnish better results than this fragmentary treatment of several hundred. It is essentially a compilation. After reading the book, one dare not swear that the author has ever seen a single one of all the animals described, unless it be some of the common sea-creatures of the Massachusetts coast. The illustrations are attractive, reasonably accurate, and many of them artistic. The mechanical part of the book is well done.

Die Psychischen Störungen des Kindesalters. Von Dr. H. EMMINGHAUS. Tübingen.

WHILE this work by an eminent German alienist is primarily designed for specialists, it contains a number of interesting observations valuable to all who are concerned in the training of children, and illustrating from an unusual point of view certain marked characteristics of child-mind. The limitation of 'childhood' strictly to the period before the establishing of the functions that connect the individual with the race is at once significant: it gives the physiological basis for much of what is distinctive in child-life, and accents the enormity of the field of thought and feeling which the approach of adolescence suddenly reveals. As mental disease is to a large extent a concomitant of civilization, and this in turn is dependent upon a general and prolonged brain-culture, it is easy to see that the child who has not yet reached the stage where character is established, where keen competition excites each brain-cell to a maximum of action, is spared a large proportion of mental disease. This fact, then, that mental diseases are far less common among children than among adults, with the further fact that the affliction of children by a large class of mental diseases not uncommon in adults is a sporadic occurrence, it is essential to bear in mind. Since the influence of a pernicious environment is responsible for only a small share of mental breakdown in childhood, it follows that heredity — 'the sins of the fathers' — is the great disposing cause. And this shows itself in the production of two classes of children: (1) those who from birth show the marks of mental deficiency or perversity, or who, without any accident or maltreatment, are sure to show such marks within a few years; (2) those who show almost no suspicious symptoms in early childhood, but in whom the strains demanded of a civilized city child cause mental breakdown. It is this last numerous class of children that is open to the wise treatment of the intelligent parent and teacher as well as of the knowing physician. Another noteworthy point is that the mental abnormality of a child can be determined only by reference to a normal child of the same age, and with an appreciation of certain traits, which, almost always pathological when occurring in adults, are within the range of normal individuality in children. The analogy between the acts of the insane and the traits of children is often drawn. This includes more than the degenerative processes of senile dementia (second childhood), and is shown, for example, in the passion for collecting all sorts of curiosities, odds and ends, and the like (common to certain forms of mania). The most striking instance of this analogy is that of the wantonness of the actions in the transition period between boyhood and youth, for which the Germans have the term *Flegeljahre*. Here there is all the recklessness of demeanor, bigness of plans, swaggering egotism, and excitable caprice characteristic of developed mania. But it is only in the presence of predisposing causes that this period leaves the region of the normal; and the frequency of runaways from home, and other cravings for a free roaming life that appear at this age, suggest that a rational outlet for this superfluous energy might be provided.

Leaving these general considerations, a few points of illustrative value should be mentioned. In an interesting chapter on suicides in children, Dr. Emminghaus accents the importance of one-sided precocity as a disposing factor. Ideas belonging to a more mature period of life are by accident, by exciting literature or other cause, planted in a yielding brain, that has not yet acquired the stability of will, or the firm distinctiveness of moral habit, that keeps such weird notions from realization in action. Nothing could better illustrate the mischievous tendency fostered by competitive examinations, to goad children on ahead of their years, with a show of great brilliancy, but a brilliancy dangerous by lack of a sound physiological basis. The triviality of the alleged cause of suicide is only a further evidence of the abnormality (usually hereditary) of such children.[1]

Idiocy and imbecility have always been the type of mental disease in children. Their ultimate relation with other forms of insanity is likewise well understood, and it has been spoken of as nature's method of cutting off the progeny of a degenerate strain. While by its nature incurable, modern study has succeeded, by an early appreciation of the condition, in rescuing all but the severest forms from the utter helplessness formerly so common.

Finally, this very imperfect sketch of Dr. Emminghaus's point of view should not be completed without mentioning that the sharply defined plan of his work prevents him from recognizing that host of mental affections whose germs are often innate, and whose prodromal symptoms often clearly manifest in childhood, but which come to distinct view only later in life, especially at the periods of intense physiological change.

The Relative Proportions of the Steam-Engine. By WILLIAM DENNIS MARKS. Philadelphia, Lippincott. 8°.

THE little book lying before us is a volume containing matter of value and interest to technical schools. It represents the first attempt which, so far as we are aware, has ever been made to determine, by correct methods and in any considerable detail, the proportions of the parts of the steam-engine. It is a singular fact, that notwithstanding the importance of the steam-engine, and its attractiveness to scientific writers on applied mechanics, no treatise of this character has ever before been produced. The general theory of the heat-engines has, especially during the present generation and since the time of Rankine and of Clausius' work, been written and re-written by many writers, great and small, and has been elaborated with all the ingenuity that such authors are capable of; but not one has hitherto had the good judgment, the patience, and the ability, to produce a good book on the proportioning of its rods and cranks, its fly-wheels and its cylinders. Some such work has been done by a few European writers; but none have devoted themselves to the production of a special treatise upon the subject.

Professor Marks has gone into the work with a zeal which could not but be fruitful of result, and has produced a book which will be of very great value to the profession and in the schools. Collating all that could be found in standard writers on the strength of materials and on machine design, he has added much useful material as the result of his own investigations, and has thus put into convenient form and into a single volume a very large amount of fact and calculation indispensable to the student in engineering and to the designer of machinery of this kind. A chapter is devoted to the study of the proportions of the steam-cylinder and the calculation of power; another to the sizes of bolts, areas of ports, and size of piston-rods. The proportions of fastenings, such as gibs and keys; the size and shape of the connecting-rod and its connections; the sizes, forms, and proportions of crank-pins, and the proportioning of the crank in wrought or cast iron and in steel, — form the subjects of succeeding chapters; and the size of the crank-shaft in the several available metals is calculated by carefully established formulas and rules. Among the best parts of the book are the studies of the effect of the fly-wheel, and its action as a regulator. This is probably the most complete and practically valuable discussion of this subject to be found. The last chapter, that on the governor, is the least satisfactory in the book; and it would seem that the writer had not yet worked up to that point in his progress toward his ideal of his book.

[1] It is interesting to note that even in children the modes of suicide in the two sexes are strikingly different. The boys in seventy-five per cent of all cases hang themselves, in fifteen per cent drown themselves, in three per cent poison themselves, and never stab themselves. Of the girls, only ten per cent meet death by hanging, but sixty-four per cent by drowning, thirteen per cent by poison, and eight per cent by stabbing.

Two chapters are given to the study of the 'limitations of the steam-engine,' a phrase of somewhat awkward form rhetorically, but which is familiar to all engineers interested in the subject as relating to the limits set to the efficiency of the machine by the counteracting influences of 'cylinder condensation,' — another awkward phrase, meaning condensation of steam in the steam-cylinder, — and of conduction and radiation or other forms of waste which distinguish the actual from the ideal engine. Here the author takes the hitherto unconquered bull by the horns, and gains the honor of having been the first to produce a rational formula embodying what are supposed to be the laws of this method of transmission of heat, and of loss of engine efficiency due to it. The resulting expression is somewhat complicated; but it is justified by experiment, so far as comparison has been carried by its author, and may be expected to stand until further progress is made in investigation of the actual conditions, — which are unquestionably far from being few or uninvolved, — and extended research shall have thrown more light upon a problem which is to-day the most important in the whole theory of the steam-engine.

Space does not permit the criticism in detail of this or of any other part of the book. It is rich in valuable material, and although, like the angels, not absolutely without fault, in the opinion of well-informed engineers, either in matter or in manner, deserves exceptionally high praise for its wealth of excellences.

The Ancient Cities of the New World. By Désiré Charnay. New York, Harper. 8°.

In the present volume Désiré Charnay gives the results of his long and careful explorations in Central America, which were begun in 1857. Since that time, all his energies have been directed towards the collection and preservation of the antiquities of that country. As the expenses of his expeditions were defrayed in part by the French Government, in part by an American citizen, Mr. P. Lorillard, his collections are deposited in the Trocadero in Paris, and in Washington: they are indispensable for all future studies of the culture of ancient Central America. The book under review is as well pleasant to read — describing, as it does, the travels of the author and the present state of the country — as of scientific value, giving the results of his studies, and showing in numerous splendid illustrations the ancient monuments and other kinds of relics, as well as beautiful views and characteristic groups.

It was the main object of the expedition with which the author was intrusted to collect authentic material for a thorough study of the ancient civilization of Central America: therefore his studies were almost exclusively directed to the collecting of relics, photographing of buildings and reliefs, and making casts of the inscriptions and bas-reliefs. The material he gives in this line cannot be excelled. His researches lead him to the conclusion that the American civilization at the time of the conquest was of comparatively recent origin. It is his opinion that all its branches bear the characteristics of Toltec civilization, and that, by studying the monuments, the migrations and the gradual development of Toltec art may be discovered. A map shows the author's opinion regarding the subject. He lets the prehistoric Toltecs immigrate from the north-west. From the plateau of the City of Mexico two branches emigrated, — the Gulf branch and the Pacific branch. Subdivisions of the former invaded Yucatan. He lets the two principal divisions meet in Copan, the south-eastern terminus of their migrations. "The Toltecs," he says, "migrated south, following the coasts of both oceans. They ceased to exist as a nation after the disruption of their empire; but their scattered remnants carried on the work of civilization in Central America, on the high plateaus, and in Anahuac, evidenced in the strong resemblance that the civilizations of these various regions bear to one another." The time of the erection of the largest buildings and temples he supposes to be about the twelfth century.

We cannot accept those theories of the author referring to the connection between the art of eastern Asia and Central America. A thorough and detailed comparison has never been made, and superficial similarities of monuments and customs cannot be a sufficient proof of a common origin.

Since the present volume was written, the author has accomplished a new journey to his favorite field of explorations, a preliminary report of which is being published in *Le Tour du Monde* and in the *Globus*. The recent enterprise of this devoted explorer has not been less successful than the former ones, some results of which are fortunately made accessible in the volume just published.

Living Lights. By Charles Frederick Holder. New York, Scribner. 12°.

Mr. Holder has thrown into a popular form the substance of what is known about phosphorescent animals, illuminated by occasional coruscations of imagination. Most of his readers will be surprised to learn that the power of emitting light is so widely shared by animals of all classes. Not only do fire-flies fly, glow-worms glow, and zoöphytes twinkle in the sea, but sea-anemones, alcyonarians, gorgonias, star-fishes, earth-worms, crabs, shell-fish, lizards, frogs, toads, fishes, birds, monkeys, and men must be added, according to Mr. Holder, to the number of animals capable of giving forth light. In the author's preface, he says, "In the United States there are ten thousand enrolled young naturalists, comprising the Agassiz Association. As one of a committee solicited to answer questions propounded by the young people, . . . I have often been surprised at the nature of the queries, which shows that this army of young observers includes many who are not merely collectors of curiosities, but are naturalists in the best sense. They are systematic inquirers, and working in the right direction to become scientists, should they continue. It is to these young scientists . . . that this volume is addressed." While we welcome any book that will serve to awaken in the young an earnest desire to study nature, and while this fascinating volume will certainly awaken interest, it is all the more to be regretted that the author is so fond of pyrotechnical natural history. He loves to hear the sigh of pleasurable surprise that rises from his audience as he sets off a pyrosomatic rocket, or kindles pavonian flame. This fault appears especially in the illustrations, which, for young people, should be accurate, since from them they derive their lasting impressions. Not to rely on our own judgment, we quote the author's own words, "It is evident that illustrations of the phosphorescence of marine animals must be more or less conjectural;" and again (the Italics are ours), "In Plate XXVII. [XXVI.?] an *ideal* view is given of the *possible* appearance of the light of a large heron." There is no excuse for 'conjectural illustrations' and 'ideal views of possible appearances' in a book of this nature. They are distinctly misleading and wrong, and have the obvious and inevitable effect of throwing discredit on some of the more highly-colored portions of the text, into which the phosphorescence of herons, lizards, monkeys, and men seems to have been admitted on very slender evidence. Those portions of the book which record the results of Mr. Holder's own observations are the most interesting, and perhaps the least illumined by fancy.

The Ventilation and Warming of School-Buildings. By Gilbert B. Morrison. New York, Appleton. 8°.

It seems a long leap from Rosenkranz's 'Philosophy of Education,' which opened the International Education Series, to this successor, which discusses practical schoolhouse-building. But Dr. Harris shows how catholic his conception of education is by including the two books in the same series.

Mr. Morrison truly says that no "subject has been more carefully and intelligently studied than the direct and ultimate effects of impure air on the human system, and on no subject is there more unanimity of competent opinion" (p. 18); but nevertheless the want of sufficient and definite information regarding the ventilation of schoolhouses is general. The lack of general information on this particular point is the more blameworthy, inasmuch as the effects of breathing impure air are not only pathological, but pedagogical and economic. The author instances this (p. 22).

A short chapter deals succinctly with the physical aspects of the air, and then the various tests for its examination are briefly described. The general theory of ventilation is illustrated by a simple experiment (p. 47); and then the natural and artificial methods of ventilation are discussed with more attention to detail. The remaining chapters discuss the general problems of ventilating and heating, and include descriptions of many of the expedients that are used for these purposes. The treatment of each question is abreast