colored fluorite in small cubic crystals is a common associate of the telluride. The rocks of the district are mostly granitic. The ores of high grade are successfully worked by smelting, rather than by milling.

WM. P BLAKE.

New Haven, Conn.

BOOK-REVIEWS.

A Pocket Key to the Birds of the Northern United States. By A. C. APGAR. Trenton, N. J., John L. Murphy. 50 p., 50 cents.

THIS small book, which can readily be carried in one's pocket, gives a simple, usable key which will enable a student of nature to determine the family and usually the genera of any of our northern birds. It will be especially valuable as a field book for one to carry in short excursions.

The Soil in Relation to Health. By H. A. MIERS, F. G. S., F. C. S., and R. CROSKEY, D. P. H. New York, Macmillan & Co. 130 p., $1.10.

As the result of the recent advance in matters of hygiene many short accounts of the hygienic characteristics of water and milk have been presented to the public. The suggestion of soil in relation to health is a somewhat new one. At the same time, it is perhaps as old as any in general estimation, for every one has some conception that certain kinds of soils are not healthful. In this little volume of 130 pages are collected all of the general facts known in relation to the hygiene of the soil. It is discussed especially in connection with the subjects of the water in the soil, the air in the soil and micro-organisms in the soil. The relation of the soil in the distribution of most important diseases is discussed, and the relation of ground water to all phenomena of health is considered carefully. In short, this little volume presents the factors which should be considered in determining the healthfulness of any locality, so far as concerns its soil.

The Inadequacy of "Natural Selection." By HERBERT SPENCER. New York, D. Appleton & Co.

IN this little pamphlet have been republished the three essays on the subject of Weismannism published by Herbert Spencer in the *Contemporary Review* in 1893. These trenchant criticisms of Weismann's theory are well known and need no comment. In this form the essays form a valuable addition to any library on the subject of recent views of heredity.

The Native Calendar of Mexico and Central America: A Study in Linguistics and Symbolism. By DANIEL G. BRINTON, M.D., LL.D. Philadelphia, David McKay.

THERE is probably no question more important in American archæology, and none more obscure, than that of the calendar in use by the natives of Mexico and Central America before the Spanish conquest. Up to the present time its solution has foiled every student, from Humboldt down.

In the essay before us the author does not take up the mathematical and astronomical problems involved, but aims to define the geographical extension of the calendar, its probable origin and its symbolic meaning. His results may be briefly stated. The same calendar system is shown to have prevailed among all the semi-civilized nations of Mexico and Central America; its origin, he inclines to think, was among that branch of the Mayan tribes which dwelt near the great ruins of Palenque and Ocozingo, and built those cities; and it arose at first not as a time-measure, but as a means of astrological divination, and only later was brought into relation to the luni-solar year-counts of the tribes who adopted it. Its essentially symbolic character is explained at considerable length; and the etymology of the day and month names in the different languages is presented with greater fullness than has hitherto been attempted.

A Theory of Development and Heredity. By HENRY B. ORR, Ph. D. NewYork, Macmillan & Co. 255 p.

ANY new presentation of the subject of heredity is welcome, for in recent years biological discussion has become so intimately associated with this subject that there is a general impression among students that no further advance along the lines of biological truth is possible until this problem of heredity is in a measure solved. Prof. Orr, of Tulane University, has endeavored to give us a new view upon the subject of development and heredity. His theory, while not absolutely new, perhaps, is certainly fresh and novel in its applications, and in its association of facts somewhat widely distinct and hitherto kept separate.

The theory of Prof. Orr has in it some of the features of Weismann, inasmuch as it is based upon the supposed continuity of germ plasm, but differs radically from Weismann's theory in assuming the possible and, indeed, the necessary modification of this germ plasm, by the conditions surrounding the adult. The theory is in reality an expansion of the old statement of Haeckel that heredity is memory. The phenomena of heredity and development are based by Prof. Orr wholly upon the nervous system of organisms, and this nervous system he traces through the lower organisms, and even extends it through the vegetable kingdom, thus finding the essential features of the nervous system co-existent with life. Heredity is habit; the germ substance is continuous from generation to generation, and its nervous factors remember. Great stress is placed upon the known facts of the acquirement through habit of reflex actions by the nervous system of the higher vertebrates, and a similar action is supposed to be possessed in all protoplasm. The theory assumes that protoplasm, like other matter, is extremely plastic and undergoes physical or molecular modifications with every action of the environment upon it. Acquired characters of the adult affect all the protoplasm of the body, including the germ plasm, and form thus the most important basis of modification and development. The theory, in short, is an attempt to show that heredity is due to slow modifications of the nervous system of the germ plasm, produced upon it by changed conditions, and applies equally to the body protoplasm or the germ plasm.

The view of Prof. Orr is suggestive, but it is doubtful if it explains very much. If Weismann's theory became popular and spread all over the world rapidly because of its simplicity and ready comprehension, it is safe to say that Prof. Orr's theory will not have a like history. The theory itself is a little more difficult to understand than it is to understand heredity without it, for to explain everything by a nervous system whose very presence is, in lower organisms, a matter of hypothesis, does not advance us very much on the line of simplicity. If Prof. Orr's theory is true, it is certain that biologists are not ready for it, because it relegates the whole subject of heredity and development to that one branch of biology of which we professedly know least, namely, that of mind. In spite of this, the discussion of Prof. Orr is full of suggestion, and will undoubtedly repay thorough reading and careful thought on the part of any student of nature.

Method and Results. By THOMAS H. HUXLEY. New York, D. Appleton & Co. 8vo., $1.25.

THIS book is the first of a series of nine bearing the general title of "Collected Essays," in which Prof. Huxley intends to gather together his scattered essays and addresses in a permanent form. One of the essays in this volume relates to Deseartes' "Discourse on Method," and is designed to set forth Prof. Huxley's own views as to the right method of scientific investigation; while the other

essays, according to the preface, show the results of this method as applied to various questions. Hence he has entitled the book "Method and Results," but the various essays are so heterogeneous in character that the reader is likely to think that almost any other title would have served about as well. The book opens with a brief autobiography, which will interest the author's admirers for the account it gives of his early life and education; but it has little to say of his later scientific activity or of the many controversies in which he has been engaged. The longest paper of those here collected is that on "The Progress of Science," which was published at the time of Queen Victoria's jubilee, and with which the readers of this journal are doubtless familiar. Of the remaining essays several, of which the earliest is dated 1866, relate to physical science and the importance of cultivating it; while no less than four, mostly of recent date, are concerned with political topics. The main object of the latter is to set forth Mr. Huxley's views on the much debated question of socialism against individualism, as to which he occupies a middle ground in opposition to the extreme doctrines of both parties. He fails, however, to lay down any principle for the practical guidance of statesmen which will enable them to steer wisely and safely between the two; while much that he says about Rousseau and the social contract, though for the most part true enough, is merely a threshing of old straw. The whole book is marked by the vigor and earnestness that characterize all of Mr. Huxley's writings, as well as by that positiveness that he usually shows even when expressing the most "agnostic" opinions. The whole series of volumes, of which this is the first, will consist, we suppose, of works that have been published in some form before; but they will be handsomely printed, and readers will like to have the essays in a collected form.

Catalogue of Section One of the Museum of the Geological Survey, Embracing the Systematic Collection of Minerals and the Collections of Economic Minerals and Rocks and Specimens Illustrative of Structural Geology. By G. CHRISTIAN HOFFMAN, F. Inst. Chem., F. R. S. C. Printed by F. E. Dawson. Ten cents.

THE recently issued catalogue of section one of the museum of the Geological Survey of Canada embraces the systematic collection of minerals, and those of economic minerals and rocks, as well as a smaller series illustrative of structural phenomena. From it we learn that the collections comprise between 6,000 and 7,000 specimens. The systematic series is arranged in accordance with the classification employed in the latest edition of Dana's Mineralogy. The economic series is arranged as in the following synopsis: I. Metals and Their Ores. II. Minerals Applicable to Certain Chemical Manufactures. III. Minerals Used in the Production of Light and Heat. IV. Minerals (and Material Manufactured from Certain of the Same) Applicable to Common and Decorative Construction. V. Minerals Employed as Pigments. VI. Refractory (Fire Resisting) Minerals. VII. Brines, Salt and Mineral Waters. VIII. Minerals Applicable to the Fine Arts and to Jewelry. IX. Minerals Employed, with or without Previous Preparation, as Fertilizers. X. Minerals Employed for Grinding and Polishing. XI. Minerals of Miscellaneous Application.

The arrangement as above outlined is not wholly free from defects, but the present writer will venture the assertion that no one who has himself wrestled with the problem of museum installation will be inclined to criticize it too harshly. It will be always an open question as to whether, in such cases, material had best be arranged by kinds, and their use indicated by labels and handbooks, or whether we should attempt to classify according to usage, as above. The first method is much the easier, and to the systematic student the more useful since it involves much less duplication of material. Unfortunately the visiting public usually prefer seeing specimens to reading labels; at least the specimen must be seen first. Hence some such arrangement as that adopted by the Canadian Survey seems most nearly to meet their wants, though it must be acknowledged that it is wasteful of both space and materials, and vastly more troublesome in carrying out. The mineral quartz well illustrates this point. In its various forms it is used for optical purposes; in jewelry; as an abrading material; in the manufacture of glass, china or earthenware; as an adulterant in paints, and (in the form of sand) in mortar and brick making. This involves a duplication and reduplication of materials and labels which is at least trying. Concerning the effectiveness of the exhibit, naturally nothing can be learned merely from a perusal of a catalogue without illustrations other than a diagram of the exhibition hall. The least that can be said, is that it shows a very pains-taking and commendable attempt at making the work of the survey available to the public.

Examen Sommaire des Boissons Falsifiées. PAR ALEX. HÉBART, Préparateur aux travaux pratiques de Chimie à l'Ecole de Médecine. Paris, Gauthier-Villars et Fils. 171 p. 1893. (Broché 2 fr 50c. Cartonné 3 fr.)

IN this work is comprised a study of the more frequent of the adulterations with which many modern manufacturers load our wines and other table liquors. M. Hébart has aimed to produce a work for the educated public and for the amateur, which will be at once readable and intelligible to all of even elementary acquaintance with the science of chemistry. Unlike some other books of like intention, this manner of treatment has not drawn from the scientific usefulness of the work, and while many theoretically and practically difficult methods of analysis are omitted those which are described are admirable for their accuracy and applicability. A large number of important facts are advanced in the five chapters devoted successively to wines, ciders, beers, brandy and liquors, and vinegar, and at the same time many popular fancies regarding the adulterations of these liquids are exposed. In general terms the treatment in each of the above named chapters is as follows: First, a discussion of the history and composition of the crude material and finished products; second, a summary of the different varieties produced, and, third, a study of the adulterations and their characteristics, with particular attention given to those forms of adulteration which are most commonly met with. A popular exposition of scientific facts treated successfully in a scientific manner is sufficiently rare to make this work of M. Hébart's unique and of considerable value.

A Laboratory Guide for a Twenty Weeks' Course in General Chemistry. By GEORGE WILLARD BENNETT, A. M., Instructor in Chemistry, High School, and Chemist for the City of Indianapolis, Ind. Boston, D. C. Heath & Co. 163 p. 1893.

THIS little book is designed as an aid to the student in elementary chemistry and is addressed to him alone, with words of advice as to chemical manipulation and laboratory methods. The experiments (over 150 in number) are systematically arranged and are so placed before the pupil as to aid him in drawing his own conclusions by logical deductions from the facts observed. Methods of measurement, the comparison of physical and chemical change, the properties of the non-metals, their compounds, and the metals are illustrated in succession and with simplicity. In several cases the experiments have, however, been rather injudiciously chosen, as, for in-