among the Onondagas yet. In both cases these may be due to a new environment. The flat soapstone vessels, with their many perforations, are earlier in New York than the Iroquois occupancy, and altogether apart from it. Many of them have handles, and they occur along the larger streams. The material is not found in the State, as far as I remember, and they seem to have been brought here by fishing parties. The common forms are like some Eskimo vessels.

The figure on page 136, representing a man's belt, is of special interest, as showing the reputed form and material of the primitive Iroquois council belt, afterwards made of wampum. The foundation of this Eskimo belt is like that of a wampum belt, but quills, or shafts of feathers, form the pattern instead of beads. Now, it is a clearly proved fact that the Iroquois and their predecessors in New York had no shell beads suitable for belts, and very few at all. Loskiel said that they used small colored sticks. In a paper on "Hiawatha," and in my "Iroquois Trail," I have given some Iroquois stories on their first use of wampum, in some of which the wampum bird figures. One of these represents Hiawatha stringing the quills of the legendary black eagle. The Mohawk chief, however, cannot call down the sacred bird, and sends a string of partridge quills in return. An Onondaga told me that their early belts were made of the quills of birds or of porcupines, which were afterwards replaced with beads. The latter have been found on no early sites, and are quite modern with them.

W. M. BEAUCHAMP.

Baldwinsville, N. Y., Dec. 4, 1893.

A MINIATURE WATER LILY.

DURING an extended tour the past summer in northern Minnesota I came upon a beautiful little white water lily. It is an almost exact miniature of *Nymphea odorata*. The flowers are about an inch and a half across. The leaves are oval-sagittate, three-fourths inches long. I found it only on the south branch of the Tamarack river, which flows into the northeast corner of Red Lake. It is there quite abundant. Can any of your readers give more information concerning it?

J. E. TODD.

University of South Dakota, Dec. 1.

FEIGNED DEATH IN SNAKES.

IN *Science* for Nov. 3 is an article on "Feigned Death in Snakes." Probably the writer is correct in his statement that the Heterodon does not (usually) bite himself just before feigning death. I recall one instance, however, in which a large black blowing viper, in the act of feigning death, contrived somehow to get his teeth (such as they were) caught in the skin on his side, and he was lying thus when I picked him up and loosed the teeth. This may have been accidental. I have often tried to get these snakes to bite something—anything—my hand, for instance, and never succeeded. But I have occasionally had one of them strike me a sharp rap with the end of his nose—of course without doing any damage. Moreover, I have not observed that they *usually* eject the contents of the stomach. When one of them has recently swallowed something, especially if it is something bulky, he will often (perhaps always) eject it before trying to escape or feigning death. But otherwise, my observation has not led me to believe that it is a common practice.

However, the thing that I especially desired to hear about was the action of rattlesnakes under similar circumstances. I have never seen a rattlesnake feign death, but reliable parties have reported the fact; only they generally speak of it as the snake killing himself. For they all state that the rattlesnake does bite himself and then seems to die. (The quickness with which they appear to die is suspicious). Now Dr. Mitchell states, after much study and experiment with the poison of snakes, that the poison of a rattlesnake injected under the skin of the same animal does not cause death. It is about these animals and their apparently pretended suicide that I would much like to hear.

J. W. KILPATRICK.

Fayette, Mo., Dec. 1.

DR. TOPINARD AND THE SERPENT MOUND.

IN the November 10th issue of *Science* Dr. Brinton has very properly replied to Dr. Paul Topinard, the eminent French anthropologist. American students, who have been so frequently told how much more the French know concerning prehistoric archæology than the scientists of this country, will find a great deal of satisfaction in noting the ignorance which the great savant Dr. Topinard displays in his article. I wish to call the attention of the readers of *Science* to the fact that, while Squier and Davis published an excellent map of the Serpent Mound (in Adams County, Ohio), Caleb Atwater wrote concerning it in 1820. So the eminent Frenchman has made a mistake of about sixty years in attributing the discovery to Professor Putnam. One can easily understand and overlook a mistake in locating or describing the small earthworks or western ruins on the part of the distinguished foreigner, but, after all that has been published about our greatest monument, the Serpent Mound, it is very strange that one whose entire life has been given to the study of prehistoric peoples should have fallen into such an error regarding it.

WARREN K. MOOREHEAD.

THE HARDNESS OF CARBORUNDUM.

REFERRING to my article on "Carborundum" (*Science*, XXII., 141), it is there stated that the discoverer of this substance claimed that it would cut and polish the diamond. In the December number of the *Am. Jour. Sci.*, XLVI., 473, Mr. G. F. Kunz states the result of an experiment made by him to determine this. A new wheel was provided, and, after several trials, it was found that the carborundum, though hard enough to cut sapphire and corundum, would not cut or polish the diamond. The carborundum crystals may be scratched by diamond points. The hardness is thus between 9 and 10, and it is, next to the diamond, the hardest substance known.

WM. P. BLAKE.

LATE-BLOOMING TREES.

WHILE at Brielle, N. J., I noticed, during the first week in September, several apple trees blooming quite freshly, and I have reports from Alpine, N. J., of pear trees and horse chestnuts being in bloom. Can any of your readers give an explanation of the cause and the effects (upon the trees) of this occurrence?

WALTER MENDELSON.

New York City.

TELLURIDE OF GOLD, CRIPPLE CREEK, COLORADO.

THE native gold of Cripple Creek, whether obtained from the placers or from the veins, is remarkably fine, being worth twenty dollars, or more, per ounce. It contains very little silver, and appears to be derived from a telluride allied to, if not identical with, the species calaverite, which contains about 41 per cent. of gold. The telluride is silver white, and is in prismatic crystals, much striated. In the oxidized ores the tellurium has leached out and left the gold behind in a spongy condition, but retaining the form of the original crystal A purple-

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