lake, with its bright, sparkling waters, free from marine vegetation of any sort.

Mr. Greene also says (p. 76), "The evidence of travellers does not, however, support the suggestion that the Red Sea is remarkable for an excessive supply of seaweed." From Ehrenberg, 'Die korallenbänke,' 1832, to the last and best authority on the Red Sea (Klunziger, Upper Egypt, 1878, pp. 345–376), we are assured of the direct contrary of Mr. Greene's assertion. "A celebrated plant is the shora (Avicennia officinalis), which forms large, dense groves in the sea, these being laid bare only at very low ebb. . . . The sea-grass meadows (*gisua* of the Arabs), which we have already often mentioned, and which are met with partly in depressions in the surface of the reef, partly on the bottom of the sea (especially in harbors), afford concealment to a special class of fishes, many of which are distinguished by possessing a green color." — (*Klunziger*, pp. 240, 375.) H. O. [918

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

PUBLIC AND PRIVATE INSTITUTIONS.

Boston society of natural history.

The collection of minerals. — The society has just finished the arrangement of its collection of minerals with the express purpose of offering it as an illustration of the mode of arrangement to be adopted throughout their museum. The curator's report, shortly to be printed, has a detailed account of the collection, from which we give the following account: —

The exhibition is divided into three parts: I. Comparative mineralogy; II. Synopsis of classification; III. Systematic collection.

I. Under the head of comparative mineralogy, the following topics are treated by means of series of specimens: 1°. Composition and chemical relations of minerals; 2°. Form and structure of minerals; crystallography; 3°. Physical properties of minerals.

1°. Under the first head, such subdivisions as the variation of minerals in composition are dealt with in the cases by the exhibition of several selected series, — (*a*) variations due to original mixtures; (*b*) variations due to decomposition and alteration; (*c*) variations due to chemical substitution. The first (*a*) of these sub-topics, for example, is exhibited in a series of seven minerals. Three of these are varieties of amphibole, and display the distinct colors and aspect due to changes in the chemical composition of the varieties. The second (*b*) is shown by five minerals, among which are orthoclase and wernerite, — quite distinct substances, but which are undergoing reduction by decomposition to the same mineral, kaolinite. In the third (*c*) only one substance, phyrrhotite, and its elements, sulphur and iron (which are placed together upon one tablet), is set apart for the exposition of the differences which may exist between the elementary constituents of a mineral, and the compounds resulting from their union.

The relations of water in the composition of minerals is dealt with in a series running from a strictly anhydrous hematite to natron (hydr. carb. sodium), having 55 per cent of water. There are twelve specimens in this series, and behind each specimen a tube exhibits the relative proportion of water.

2°. Form and structure presented no very serious difficulties beyond the need of finding persons capable of making the special models which were required. This was satisfactorily accomplished after some delay.

3°. As examples of the methods pursued in illustrating the physical properties of minerals, we can use the following: —

(*a*) The density series, showing the range of minerals in specific gravity. This series consists of twenty-seven minerals, including gold, which is twenty-one times heavier than water, and petroleum, which is lighter than that standard liquid. This gradation is made apparent to the eye by means of glass tubes containing equal weights of each of the substances, reduced in the case of solids to a fine powder. Thus gold, with specific gravity 19.5, the heaviest substance, has necessarily the shortest, and petroleum, with specific gravity .75, the longest, tube; and the intermediate tubes show the gradations between these. Thus a series is formed which exhibits clearly that the volume of minerals is inversely proportional to their specific gravity or weight.

There are a number of series showing the relations of minerals to light, among which we may select, by way of illustration, that of the color test, or streak, of minerals.

(*b*) Streak series: lustre metallic, and color mainly essential. This label stands at the head of nine specimens, each mounted upon the same block, with a piece of novaculite of uniform size, such as is used to try the streak of minerals, partly covered with a band of the powdered mineral.

(*c*) Streak series: lustre non-metallic, and color non-essential except when white. This label is at the head of a precisely similar series, but consisting of eighteen minerals with their accompanying stones, exhibiting the great contrast between the color of minerals themselves and of their streaks upon the white surfaces of the novaculite.

(*d*) There are also series of specimens showing the principal minerals which exhibit electrical properties either in their natural conditions, or only when acted upon by friction or heat.

(*e*) Even the taste, touch, and odor of minerals are illustrated by similar series. Though persons cannot imagine how a rare mineral tastes, feels, or smells simply from the sight of it, they all know some of the commoner minerals of the same series which are placed on exhibition. With the guidance of the collection, they can also more easily duplicate the specimens, and understand their relations.

II. In the synoptical collection, the more important and abundant elements are here repeated, and each shelf is devoted to one of the grand divisions of the mineral compounds. Each division of minerals is represented by its most characteristic species; and the subdivisions of the anhydrous and hydrous groups are indicated on the labels, wherever these occur.

III. The systematic collection begins with the native elements, which occupy one wall-case next to the synoptical collection. This is followed by the compounds. These fill the wall-cases on the remaining sides of the room; and here are exhibited the different species of minerals arranged in their proper order as classified by Professor Dana, with some slight changes in the succession of the larger divisions.

Models of the principal or most characteristic crystalline forms of each important species have been made out of plaster, and the surface hardened with paraffine in order to give a smooth finish. These are mounted in the same manner as the substances whose structure they are used to illustrate.

It was rightfully imagined, when the present general plan of arrangement for the museum was adopted, that the greatest obstacle in the path of any attempt to show that there was a gradation in the natural relations of the products of the earth would be the department of mineralogy. It has been found, however, that the separation of minerals from the mother-rocks, on account of their purer composition and definite forms, although purely artificial, has its logical uses. It enables one to explain with directness and precision the relations of all the elements and their strictly inorganic compounds, and to prepare the mind for the consideration of the more complicated aspects of the geological and biological collections. Mineralogy is therefore made the vehicle for the conveyance of almost all the preparatory facts in physics and chemistry which are essential for the purpose of the museum.

While such definite marks of gradation cannot be found in minerals as among animals and plants, there is in nearly every division of minerals, even with their present entirely artificial and probably unnatural classification, such distinctions as those of anhydrous and hydrous groups, the simple and double sulphides, the binary and ternary compounds. These have not yet been brought into correlation with the molecular structure, or with each other, in any natural classification; and therefore we cannot say that the hydrous compounds are necessarily, on account of the addition of water to their chemical composition, more complicated in their molecular structure than the anhydrous, or that the same is true of the double as compared with the simple sulphides, or yet of the ternary as compared with the binary compounds.

Notwithstanding these difficulties, the facts are in every case facts of gradation. It makes no difference whether the gradation leads up or down, or mingles both of these tendencies. Whatever direction the true classification may eventually take is immaterial. The indications of what is already known show that gradation of some sort must be its marked characteristic; and this alone is sufficient to harmonize the whole provisionally with the other departments of the museum.

Important support, however, is derived from an opinion in which all chemists and mineralogists consulted seem disposed to agree. There are decided grounds for the belief that both the chemical and the molecular constitution of the elements may be considered as less complicated than that of the purely inorganic and probably derivative compounds, and these, in turn, simpler than the hydro-carbons. Theoretically, also, one is safe in assuming that the latter, which are the products of organic bodies composed of their fossil remains, oils, gums, etc., more or less altered by the physical and chemical conditions to which they have been subjected, are of later derivation in time than the strictly inorganic compounds, and that these, in turn, are probably more recent, as a rule, than the elements of which they are made up.

These fundamental facts are quite sufficient for the purposes of the collection, and permit a demonstration of the fact that the same principles of classification apply in this department as in all others, whether inorganic or organic.

The curator is already in receipt of letters from eminent teachers and others, expressing their gratification at the results of the work in this department, and some of them strongly urge the immediate publication of a proper catalogue.

Harvard university, Cambridge, Mass.

The Jefferson physical laboratory. — The plans of the new physical laboratory, presented to the university by Mr. T. Jefferson Coolidge, have now been so far discussed that we may give a general account of them. The building will be placed about in the centre of Holmes Field, in the rear of the Scientific school, to avoid as much as possible all jars from passing vehicles. The nearest street (Oxford Street) will be about 300 feet from the east wing.

The building consists of an eastern and a western section, each 60×60, connected by a central piece 80×40 ft. The eastern section will contain a large lecture-room, with a seating-capacity of between 275 and 300 students; above this, an immense laboratory, 60×60 ft., for the general use of undergraduates and less advanced students. The basement of this section will be occupied by a workshop, a battery-room, boilers, and coal-bins. The north side of the east section, flanking the lecture-room, is occupied by three stories of rooms for the physical cabinet. These also extend on the north side of the central piece, and are so arranged as to lead conveniently into the lecture-room, the general laboratory, the recitation-rooms, and also into the western section, where the rooms for special investigations are located.

In the central piece, besides the space occupied by the cabinet, there are two recitation-rooms, a balance-room on the first floor, and, on the third floor, rooms for electric measurements, photometry, and a general library and balance room. Small entries and stairways at the east and west end of the centre piece give easy access to all parts of the building for the professors and special students. The undergraduates have access to the lecture-room and general laboratory at the east end of the building by a stairway removed as far as practicable from the rooms devoted to special investigations. This arrangement, and the position of the engines and dynamos on the outside of the building across a deep insulating ditch, will prevent the jar of the machinery and the tramping of students from interfering with delicate observations.

The basement of the central piece is occupied by receiving-rooms, and storage for heavy pieces of apparatus.

The western section is the one which the professors and instructors of physics have most carefully considered. The lower floor contains rooms of moderate size, devoted to general use and special investigations, — rooms which will be fitted up with reference to electricity, heat, magnetism, and sound. In each room of the first floor there are independent piers, built up from the basement, insulated from the walls and floors upon which delicate instruments are to be placed. Similar rooms devoted to optics, electricity, and the Rumford laboratory, are located upon the second story. The third floor is as yet assigned to no definite use, and, with the exception of a room for photography, can be left to meet the wants of the future. The basement of this section is occupied by a room for magnetism, one for heat, and one for weights and measures. A room for constant temperature is excavated below the basement floor in the centre of the building.

To afford facilities for the study of atmospheric physics and experiments for which great height is needed, a tower runs through the central part of the western section. The tower has a total height of 60 feet; it is built with double walls to isolate it from the rest of the building, the outer walls carrying the floors.

Above the roof, the sides of the tower are almost entirely of glass. There is free access to the four sides of the tower, as well as to the top, which is at a height of 72 feet from the basement-floor. Openings are left at every story to allow light to be sent to the central part of the tower. The piers of the first floor are also so arranged as to obtain lines of considerable length across the building. The doors are so placed that adjoining rooms are readily thrown open together.

The laboratory, built to commemorate Ellen Wayles Coolidge, grand-daughter of Thomas Jefferson, has been named the 'Jefferson laboratory.' It seems most appropriate that the name of one who was among the first to recognize the value of university education in this country should be connected with a building to be devoted to the investigation of some of the most interesting problems of nature.

The cost of the building, with the necessary fixtures, will be about $115,000. There is a fund of $75,000, the income of which is to be expended for the benefit of the physical laboratory, in addition to the appropriations and expenditures now incurred for physics by the college.

NOTES AND NEWS.

Zoölogists the world over will regret to learn of the death of the genial and talented Wilhelm Karl Hartwig Peters, director of the zoölogical museum of Berlin, and younger brother of Dr. Peters of our own Clinton observatory. Dr. Peters was born at Coldenbüttel, near Eiderstedt, in Schleswig, on April 22, 1815, and died in Berlin on the 20th of last month. Immediately after completing his studies in medicine and natural history at Copenhagen and Berlin, he undertook a journey to southern France and Italy to investigate the fauna of the Mediterranean. Returning to Berlin in 1840 as assistant in the anatomical institute of the university, he soon laid his plans for an independent investigation of the unexplored regions of Mozambique, in which he received the advice and support of his distinguished friends, Johannes Müller, Humboldt, Ritter, Ehrenberg, and Lichtenstein, and the powerful patronage of the king, Frederic William IV. He left for this journey — the great event of his life — in 1842, and was absent more than five years. Two years were spent in the interior of Mozambique; but he also made journeys to the Comoro Islands, to Zanzibar, Madagascar, and the Cape, and, before his return, visited the coast of India. His *Reise nach Mozambique*, published between 1852 and 1868 in five quarto volumes, is the result of this exploration, and is a model for faunal work of this kind. Returning to Berlin in 1848, he was made prosector at the institute, afterwards professor extraordinary, and in 1857 succeeded Lichtenstein as full professor in the university, and director of the zoölogical museum. The museum, under his administration, early took the highest rank, which it has ever since held; and more than one American student has been cordially received within its walls. Peters's studies were mainly given to the world in Müller's Archiv, and the publications of the Berlin academy, to which he was elected in 1851. They covered nearly the entire field of zoölogy, but were specially devoted to mammals, reptiles, amphibians, and fish. His geographical discoveries in Mozambique were published by Kiepert in 1849 in a map; and Bleek's *Languages of Mozambique* contains a portion of his linguistic studies.

— The April number of the Harvard university bulletin, which has just appeared, contains fifty-six pages, of which thirty-one are devoted to the book-list. We notice recorded a copy (one of thirty) of the Maya manuscript in the Dresden library, reproduced in polychromatic photography. The appendices contain another instalment of Mr. Bliss's classified index to the maps in Petermann's Geographische mittheilungen (twelve pages), and of Mr. Winsor's valuable bibliography of Ptolemy's geography (seven pages). The University notes mention additions to the zoölogical museum, the purpose of the observatory to collect astronomical photographs, and give an account, reprinted on p. 437, of the plans of the new Jefferson physical laboratory. Among the appointments gazetted, we notice that of Mr. J. Rayner Edmands and Mr. John Ritchie, jun., to the observatory, to be in charge of the time-service and the distribution of astronomical information respectively.

— A general veterinary establishment for the treatment and care of lame, sick, or wounded horses, cattle, sheep, and dogs, is to be maintained in connection with the school of veterinary medicine, of Harvard university. The hospital will probably be ready for occupation June 15. The patients will be under the professional charge of Mr. Charles P. Lyman, fellow of the Royal college of veterinary surgeons, London, and professor of veterinary medicine in the university. The school will also have at its disposal commodious buildings and pastures at the Bussey farm, where cattle can be received and cared for, and where horses not required for present use, or suffering from lamenesses or illnesses which require long seasons of rest, can receive all proper care and treatment, together with the benefit of grass-paddocks in summer, and a warm straw-yard in winter. Any person having sick or lame animals to be cared for can procure for them the benefits of the establishment upon the payment of a fixed sum per day, covering board, treatment, and medicines. To each subscriber of ten dollars a year, a number of privileges will be given. On Tuesdays and Fridays a free clinic will be held.

— The semi-annual meeting of the American antiquarian society was held in Boston on April 25 at eleven o'clock. About fifty members were present. The reports of the officers showed that the affairs of