Fagopyrum. He has grown the plant in different sorts of earth, and has found that the bacteria are very useful; since the plants grown in earth filled with bacteria are much bigger and finer than those grown in sterilized *humus*.

The last two numbers of the *Revue scientifique* contain articles on the zoölogical stations of Cette and Concarneau. The laboratory of Cette is well known, and presents the great advantage of a rich fauna to be found in the brackish waters of pools in the salt-marshes, and in fresh water. No place in France offers such a happy combination of different fields for biological students. Professor Sabatier of Montpellier, well known by his numerous and interesting researches on the origin of sexual elements in the vertebrates, founded this laboratory, and he now wishes to develop it. He is trying to raise the money for the purchase of a strip of land, and especially for a new building. It is to be hoped that he will succeed. As to Concarneau, the oldest of all our marine laboratories, it seems to be in good order. It was founded by Costi in 1859. It is a small laboratory, and cannot compete with its younger companions of Roscoff, Banyuls, Cette, Villefranche, and Wincereux; but yet it may render good service. Interesting researches concerning the temperature of the ocean at different depths have been conducted by M. Goïz; and it is intended to study the habits and biology of sardines, a fish very abundant on the coast at certain times of the year, and concerning which very little is yet known. V.

Paris, May 19.

NOTES AND NEWS.

THE provincial assembly of San Paulo has voted an appropriation of fifty contos of reis (equivalent to about twenty-five thousand dollars) to begin a geographical and geological survey of that province on the plan followed by the surveys of the territories of the United States; and work has already been commenced with the following corps: Prof. Orville A. Derby, director; Dr. Theodoro Sampaio, chief topographer; Dr. Luis Felippe Gonzaga de Campos, and Dr. Francises de Paula Oliveira, geologists. The first work of the commission will be the exploration of the river Paranapanema from near its source to its junction with the Parana, which promises to become an important link in the system of internal communications of the empire, and to afford a complete geological section across the various belts of sedimentary formations of the province. The province of San Paulo joins that of Rio de Janeiro on the south, is one of the most interesting and important of the empire, and has as yet received but little attention from geologists. It is very extensive, is known to possess great natural resources, and embraces the principal coffee-growing sections of Brazil. Operations have probably been begun by this time. With respect to his recent studies in Brazil, Mr. Derby writes, "I have been giving a great deal of attention to petrographical work, with very encouraging results, as I find that the geology of the vicinity of Rio de Janeiro is not so monotonous as I had supposed, as there are within easy reach of the city three ancient volcanic centres, with a great and perplexing variety of eruptive rocks, both in large masses and in small dikes."

— The belief in the occurrence of 'sea-serpents' in the ocean of to-day, though hardly openly averred, is not discountenanced by not a few scientific men whose opinions are entitled to the highest consideration. Dr. J. B. Holder, after giving (in the Annals of the N. Y. academy of sciences) an historical account of a 'sea-serpent' observed near Boston, corroborates the adduced testimony by the description of a carcass of a large and unknown animal found off the coast of Florida, as related by highly creditable witnesses. The creature described was over forty feet in length, and nowhere of more than two feet in diameter. Unfortunately the specimen was in an advanced state of decomposition, and no portion was saved. The discovery of the giant squids off the Atlantic coast within recent years demonstrates the possibility of other large animals yet inhabiting the ocean, of whose existence science is yet wholly unaware. May not some descendant of the cretaceous mosasaurs or plesiosaurs yet be among them?

— At a meeting of the Royal colonial institute, held on May 11, in London, a paper on 'Tasmania as it is,' was read by Mr. W. L. Dobson, chief justice of Tasmania. As to the chief industrial pursuits of Tasmania, Mr. Dobson remarked that the largest return was received from sheep's wool, and great attention was devoted to breeding merino sheep, with fleeces of the finest and densest quality. An inexhaustible supply of timber of different kinds was obtained from the dense forests of the island; and hops, oats, and potatoes were among the vegetable produce. There could be little, if any, doubt that the mining wealth of Tasmania was yet in its infancy. As to means of locomotion, 257 miles of railway had been laid down, and 117 nearly completed, and there was a network of telegraphic wires all over the inhabited portions of the colony. No aid was afforded by the state to religion; and of the population, about one-half belonged to the Church of Eng-

land, and one-fourth to the Church of Rome. He believed that Tasmania had not progressed more rapidly because she had hitherto suffered from contiguity to, and comparison with, the neighboring colonies, which offered a wider field and greater scope for the energy and enterprise of the settler. As this field, however, gradually became occupied, Tasmania's progress would again become assured. He thought, however, that a colony which had increased her revenue during the last decade from £340,000 to £550,000, and her exports from £1,000,000 to £1,400,000, was not to be deemed wanting in progress.

— Mrs. J. Lawrence Smith has presented to Harvard college a tablet in memory of her husband. The tablet is of bronze inlaid with silver, and is to be placed with the Smith collection of meteorites purchased by Harvard college after Dr. Smith's death. In the centre of the tablet there is an enamel portrait of Professor Smith, and this is surrounded by the different medals and decorations with which he was honored. It will be remembered that the collection of meteorites was sold for ten thousand dollars, of which sum Mrs. Smith contributed two thousand. With the eight thousand dollars actually received, Mrs. Smith has generously endowed the Smith medal, which is at the disposal of the National academy of sciences.

— The engraving of the various index-catalogue charts for the U. S. coast and geodetic survey has been commenced; the chart of the whole Atlantic coast and Gulf will be out by the middle of August; that for the Pacific coast will be issued Jan. 1. The Pacific coast tide-predictions for the year 1887 are now in the hands of the public printer; the predictions for the Atlantic coast will be sent to the printer this week; and the entire series will be ready for issue by the 1st of August.

— Plate No. 10 of the detailed topographical survey of the District of Columbia, made by Assistant John W. Donn of the U. S. coast survey, under the direction of the engineer commissioners of the district, has been printed and sent to the commissioners. The drawing of plate No. 16 is complete, and will be placed in the hands of the photolithographer this week. This sheet will show the location of the estate recently purchased by President Cleveland for a summer residence. For the want of sufficient funds, it has only been practicable to keep one topographical party at work on this important survey. Those having charge of the direction and execution of this work are urging congress to appropriate sufficient money to employ at least one more party and two skilled draughtsmen, in order to complete it.

— Bulletin No. 15 of the Ohio agricultural experiment-station contains an interesting account of further experiments by Prof. H. A. Weber upon the microscopic methods of distinguishing butter from other fats proposed by Dr. Thomas Taylor, and which were mentioned in a recent number of *Science*. It will be remembered that Dr. Taylor's first claim was that butter, cooled slowly under certain conditions, formed 'globules,' which, when viewed by polarized light, showed a well-defined St. Andrew's cross. Professor Weber having shown that this appearance was not characteristic of genuine butter, but might be produced in any common fat by treatment similar to that applied to the butter, Dr. Taylor then practically abandoned his claims for this test, and called particular attention to another test as being most important and characteristic. According to Dr. Taylor, if a sample of butter is viewed by polarized light, a plain selenite being placed between polarizer and analyzer, a uniform color is observed: if any solid fat, like lard or tallow, be thus viewed, the fat will exhibit prismatic colors. It is this test which has been the subject of Professor Weber's investigations, and he finds it as fallacious as the former one. Any of the fats under consideration, if melted, and cooled slowly, and then submitted to Dr. Taylor's test, will show the prismatic colors, due to the action of the comparatively large crystals formed upon the polarized light. On the other hand, the same fats, if cooled quickly, so as to prevent the formation of large crystals, present the uniform tint claimed by Dr. Taylor as characteristic of butter-fat. An interesting observation was made upon a sample of butter which had been kept in a closed tin box in the laboratory, and had become alternately hard and soft with the changes of temperature, but never melted. This butter, which had hardly been exposed to greater changes of temperature than much country butter is liable to, showed the prismatic colors claimed by Dr. Taylor as characteristic of foreign fats. Professor Weber concludes this account of his experiments in the following words: "Taking the whole of Dr. Taylor's microscopical investigations into account, it may be said that they have received more attention at the hands of American investigators than their crude methods and erroneous conclusions would warrant."

— The distinguished mechanical engineer, Adolphe Hirn, has been decorated with the Order of the rose by the emperor of Brazil.

— Assistant C. H. Boyd of the coast survey has been instructed to make an examination into the changes in the shore line in the vicinity of Monomoy, Mass.; instructions have been issued to Sub-

assistant W. C. Hodgkins to make an examination of the point at Cape Lookout where great changes have been reported since the last examination; Lieutenant-Commander Brownson, U.S.N., chief hydrographic inspector, is now in New York, inspecting the Gedney, Bache, and Endeavor; Lieut. F. S. Carter has been detached from the coast-survey steamer Gedney, and placed in charge of the vessels laid up at the New York navy-yard; reports from the steamers Paterson and McArthur, which are stationed at Wrangle, Alaska, state that the weather is very favorable for work, and the results thus far attained have been most gratifying.

— The Royal academy of sciences at Turin has announced the grand Bressa prize of twenty-four hundred dollars, to be awarded at the close of 1889 for the most meritorious work or discovery in the physical or natural sciences, produced during the years 1886–89. The prize is open to the world.

— The International literary and artistic association, says the *Academy*, will not hold its next congress at Stockholm this year, as had been arranged, but at Geneva, on the 18th of September. The subjects to be discussed will comprise the right of property in *lettres missives*, the agreements as to publication and the relations between authors and publishers, the right of property in the titles of literary and scientific productions, and the assimilation of the right of translation with that of production.

— Naturalists will recall that some fossil egg-masses of insects of extraordinary size were found a few years ago in Colorado in beds referred to the Laramie period, and considered by Scudder as indicating the existence of a neuropterous insect very closely allied to our great 'Hellgramite,' Corydalus cornutus. It now appears that precisely similar bodies, at first supposed to be of vegetable origin, have been found in the lignites of Trets, near Aix, France, associated with Nelumbium in beds universally referred to the lower Garumnian, or, even lower, to the Campanian; that is, to the horizon of the upper cretaceous. The Garumnian has already been compared to our Laramie group.

— The Würtemberg ministry has invited the governments of Bavaria, Austria, Baden, and Switzerland to participate in an examination and surveys of the deeper portions of the Lake of Constance, to serve in the preparation of an accurate map of the lake's bottom. A commission of specialists will meet in Friedrichshaven to decide upon the methods and extent of the proposed undertaking.

— Prof. G. Dewalque of Liége, the secretary of the Commission of the International congress of geologists on the map of Europe, desires to sell his large library *en bloc*, and wishes to know whether some individual or institution will not make him an offer for it on the basis of a catalogue of its contents.

— The output of shad hatched by the U. S. fish commission up to the present time has been 12,000,000. These have been sent away, as fast as hatched, to various streams, and deposited: 356,000 have gone to the Cheat River at Grafton; 370,000 to the Chattahoochee, Georgia; 626,000 to the Chickahominy; 329,000 to the Dan; 758,000 to the Mattapony; 385,000 to the Pamunky; 1,110,000 to the Occoquan; 757,000 to the Shenandoah; 380,000 to the James; 379,000 to the Appomattox; 603,000 to the Monocacy; 609,000 to the Patuxent; 1,234,000 to the Rivanna; 390,000 to the Accokeek Creek; 389,000 to Aquia Creek; 1,270,000 to the Rapidan; 391,000 to the North Anna; 1,070,000 to the Rappahannock; 1,282,000 to the Little Falls of the Potomac; 1,586,000 to the Hudson; and 1,000,000 to the Colorado. All of these fish are not, of course, counted and numbered. They are measured in the jars. It is known by actual count how many eggs are necessary to fill a jar to the depth of an inch. A quart, it is estimated, will hold 28,000 eggs.

— New discoveries of petroleum in southern California are causing much excitement, says the Los Angeles *Herald*. A well recently bored in Ventura county is yielding fifty barrels of oil daily.

LETTERS TO THE EDITOR.

*** *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Some devices for teaching historical geography.

A FRIEND having called my attention to some suggestions, in *Science* of April 9, on maps suitable for history classes, it has occurred to me that perhaps the results of several years' experimenting with different devices for teaching historic geography might be of interest to some of your readers.

That helps are needed to illustrate the intricate territorial changes of continental history, scarcely requires to be further emphasized. Much of history, indeed, is little more than the record of such changes. The contrast between the hopeless confusion of many important epochs when studied without historical maps, and the beautiful clearness of the same epochs with the maps, is simply astounding, and is the true warrant for the time honored claim of geography as one of the two eyes of history.

Having become impressed, after a deal of unsatisfactory teaching, that better machinery than the ordinary is almost a necessity, I have spent considerable time and pains trying different devices. For several years I used a map of Europe permanently