tribution ; the systematic observation of mature marketable fishes with reference to their local varieties and migrations, their conditions of life, nourishment and natural enemies ; observations on the occurrence and nature of fish food at the bottom, the surface, and intermediate waters down to the depths of at least 600 meters ; and determinations of periodic variations in the occurrence, abundance and average size of economic fishes and the causes of the same. These are briefly some of the principal points mentioned in the program of work recommended.

To carry out these investigations on a basis of international coöperation, and in order to ensure uniformity of method, it is proposed to create an international council with a central bureau and a central laboratory at an estimated annual cost, including salaries of staff, of £4,800, to be divided among the Governments concerned. No place is mentioned for this central bureau, which, however, should be conveniently situated for hydrographical and biological researches. It is considered desirable that the work should begin on May 1, 1901.

DEVONIAN FISHES FOR THE AMERICAN MUSEUM.

Through a generous gift of a Trustee, Mr. William E. Dodge, the American Museum of Natural History has recently purchased the Jay Terrell collection of fossil fishes of Ohio—forms which from their great size and formidable dentition have long been known as among the most interesting as well as the rarest of fossil vertebrates. The present collection is the result of over six years' energetic and skillful field work. It is the fourth collection which Mr. Terrell has formed : the first was secured by the late Professor J. S. Newberry, and is now preserved at Columbia University; the second is at Harvard, and the third is at Oberlin. Of popular interest in connection with the present purchase is the fact that material is now at hand for exhibiting as a single specimen the parts of the gigantic Placoderm Dinichthys Terrelli. The specimen is unusually complete and appears to be the largest hitherto secured—a jaw alone measuring nearly two feet in length. Much of the collection is of exceptional importance : it includes associated head plates of Titanichthys, jaws of Diplognathus, and immature jaws of Mylostoma.

Bashford Dean.

THE SPELLING OF 'PUERTO RICO.'

If anything further were needed to determine the proper spelling of the name of our new West Indian Island possession, it has been supplied in a decision of the President of the United States himself. Through Secretary of State Hay, under date of December 16, 1899, the President declares in favor of the spelling *Puerto* Rico, basing his decision more especially on the fact that this is the spelling followed by the people of the island. He was doubtful mindful also, however, that *Puerto* is good Spanish for port just as *Rico* is Spanish for rich. He sustains the decision of the U. S. Board on Geographic Names, made some years ago and since followed by some of the Government departments but not by others.

W. F. Morsell.

SCIENTIFIC NOTES AND NEWS.

As Science goes to press a number of our most important scientific societies are holding meetings in New Haven, Washington, New York and Chicago. The American Society of Naturalists meets at New Haven, together with the societies more or less closely affiliated with it, namely, The American Morphological Society, The Association of American Anatomists, The American Physiological Society, The American Psychological Society, The Society for Plant Morphology and Physiology, The American Folk-lore Society, Section H, Anthropology, of the American Association. A Bacteriological Society will at the same time be organized. The American Chemical Society also meets at New Haven. Western naturalists are organizing a society at Chicago. The Geological Society of America is meeting at Washington and the American Mathematical and Physical Societies at New York. We hope to publish in subsequent numbers full accounts of the meetings of these societies.

Professor William Harkness, astronomical director of the U. S. Naval Observatory,

was retired as rear admiral on December 17th, on reaching the age of sixty years. Professor Stinson Joseph Brown has been appointed to the position. He was born at Hammondsport, N. Y., in 1854, and graduated from the Naval Academy in 1876. He was employed in the U. S. Coast and Geodetic Survey and in 1881 obtained by competitive examination a professorship of mathematics in the Navy.

M. LEMOINE has been elected a member of the Section of Chemistry of the Paris Academy of Sciences in the room of the late M. Friedel. M. Lemoine received 32 of the 57 votes cast.

PROFESSOR JOSIAH ROYCE of Harvard University, sailed from New York on December 27th, in order to give his second course of Gifford Lectures at the University of Aberdeen. Professor Royce will also lecture at Glasgow and Oxford. He will return to Cambridge early in February.

PROFESSOR ALBERT P. BRIGHAM, of Colgate University, who has been abroad with his family for ten months, has returned, and will resume his college duties with the new term. During his absence, Professor Brigham has traveled extensively in England, Scotland, Germany, and Switzerland, and has spent a number of weeks in study and literary work at Oxford and Munich.

MR. ARTHUR HENRY SAVAGE LANDOR, the explorer, arrived in New York from England on December 23d.

AMONG the passengers by the mail steamer *Bakana* for the west coast of Africa on December 8th were three medical men, Dr. Christopher, Dr. Stephens, and Mr. A. Pickels, bound for Sierra Leone and Lagos. They are going out at the expense of the Colonial Office, having been selected by the Royal Society, and their work will be carried on under the auspices of the Liverpool School for Tropical Diseases.

DRS. WILLIAM OSLER and Howard Kelly, of Baltimore, have been elected honorary members of the Royal Academy of Medicine of Ireland.

THE Royal Geographical Society London has elected the following honorary corresponding members: Captain Meliton Carbajal (president of the Peruvian Geographical Society), Professor A. Bertrand (professor of topography and engineering in the University of Santiago, Chile), and Señor D. Samuel A. Lafone Quevedo, a distinguished geographer and ethnologist of Buenos Ayres.

MR. BAILEY WILLIS of the United States Geological Survey, addressed the members of the Geological Club of the University of Chicago on November 29th, on 'A Pacific Atlantis.'

THE centennial anniversary of the birth of Joseph Henry, was celebrated at his birthplace, Albany, on December 16th, at a joint meeting of the Albany Institute and the Albany Historical and Art Society. The exercises were held at the Albany Academy where Henry taught for many years before going to Princeton and the Smithsonian Institution.

THE death is announced of Dr. Birsch-Hirschfeld, professor of pathology in the University of Leipzig, at the age of 57 years.

THE death is also announced of Dr. John Frederick Hodges, professor of agriculture and lecturer on medical jurisprudence in Queen's College, Belfast. Dr. Hodges was the author of books on chemistry and agriculture and was perhaps the oldest member of the Chemical Society of London, having been elected a fellow in 1844, three years after the formation of the Society.

DR. ARTHUR COWELL STARK was killed by the explosion of a shell on November 18th at Ladysmith, where he was serving as a volunteer on the medical staff. Dr. Stark was an authority on South African ornithology and had just completed the first volume of a work on South African birds for Mr. W. L. Sclater's Fauna of South Africa.

WE regret also to record the death of Mr. N. E. Green, an artist who accomplished important scientific work in making astronomical drawings. He was a past president of the British Astronomical Association.

THE American Museum of Natural History has secured through the generosity of President Jesup the second part of the Cope collection of fishes, amphibia and reptiles. It will be remembered that by the will of the late Professor

Cope the proceeds of the sale form an endowment fund for the Philadelphia Academy of Natural Sciences.

According to a notice in the New York *Commercial Advertiser* of December 16th, the Peabody Museum at New Haven has been enriched by a valuable accession to the anthropological collections. The addition consists of Mexican and Guatemalan antiquities, about 350 pieces in all, which were brought from but two localities—Sempoala, state of Vera Cruz, and Tacana, Guatemala.

The Hon. Walter Rothschild, M.P., treasurer to the Middlesex Hospital, has sent a donation of £100 towards the maintenance of the new research laboratories for the investigation of the cause of cancer in connection with the new wing for female cancer patients of that institution.

Mr. Andrew Carnegie has offered $50,000 for a public library in Oil City, Pa., on the conditions that a site be donated, and that the city appropriate $3,000 annually for the library's support.

It is stated in *Natural Science* that the Mortimer Museum of Antiquities at Driffield, Yorkshire, contains a very good local collection. Its owner has offered it to the East Riding County Council for half its value, the value to be decided by two referees, one to be appointed by the Council and the other by Mr. Mortimer.

A communication was presented to the Senate on December 20th, from the Regents of the Smithsonian Institution suggesting the appointment of Mr. Richard Olney to fill the vacancy on the Board caused by the death of William Preston Johnson. Senator Hoar said he thought that it was the first time that the Regents had made such a suggestion. No action was taken by the Senate.

Invitations for the next agricultural conference for the West Indies have been issued by the British Department of Agriculture. It is proposed to hold the conference at Barbadoes, and the dates fixed are Saturday the 6th, and Monday, the 8th of January next. The president, Dr. D. Morris will deliver the opening address. A new feature will be the presence of representatives of the leading agricultural societies in the West Indies. The list of subjects to be dealt with covers, practically, every branch of West Indian agriculture.

At a meeting of the Fellows of the Royal Botanic Society, London, on December 8th, the chairman stated that it was very satisfactory to know that during the year 203 new Fellows had been elected, that number being higher than in any previous year since the foundation of the society. The largest number in other years was in 1850, when 186 Fellows were elected.

The British Institution of Electrical Engineering held its eleventh annual dinner on December 6th. The President, Professor Sylvanus P. Thompson occupied the chair, and speeches were made by Mr. R. E. Crompton, General Sir R. Harrison, Sir W. C. Austen-Roberts, and Lord Kelvin.

Nature states that in connection with the British Institution of Electrical Engineers, a number of local centers are being established where papers will be read and discussed at the same time, or shortly after, their reading in London. In Cape Town these informal meetings have been held for some time past, and advance copies of the Institution's papers have been read at them. A meeting for the formation of a northeastern center was held recently at the Durham College of Science, and the Council have received a petition for the establishment of a similar organization in Dublin.

The proprietors of the Marconi system of wireless telegraphy have offered the use of twenty sets of instruments to the Government on payment of $10,000 in the first instance and $10,000 a year for their use. Secretary Long has under consideration the advisability of asking Congress to make a special appropriation for the purpose.

An institution on the lines of the Pasteur Institute, bearing the name Alfonso XIII., has been established at Madrid.

A deputation appeared before the Edinburgh Town Council on November 21st to urge the establishment of a zoological garden in that city.

THE thirteenth International Medical Congress will be held at Paris from the 2d to 9th of August, 1900, in connection with the Paris Exposition. The work of the Congress is divided into five classes, each of which is sub-divided into from two to nine sections. The classes are, (1) biological sciences; (2) medical sciences; (3) surgical sciences; (4) obstetrics and gynecology, and, (5) public medicine. The biological sciences are divided into three sections (*a*) descriptive and comparative anatomy, (*b*) histology and embryology and (*c*) physiology and biological physics and chemistry. An American National Committee has been formed with Dr. William Osler as Chairman, and Dr. H. B. Jacobs (3 West Franklin street, Baltimore, Md.), as Secretary.

THE third International Ornithological Congress will be held from the 26th to the 30th of June, 1900, as one of the series of official congresses of the Paris Exposition. The work of the congresses has been divided among five sections, as follows: (1) Systematic ornithology: classification; species; anatomy and embryogeny of birds; paleontology; (2) geographical distribution; appearance of rare species in certain districts; (3) biology; oölogy; (4) economic ornithology; (5) organization and working of the international ornithological committee.

FROM the 18th to the 23d of June an International Congress of Mining and Metallurgy will be held at Paris. The program proposes the following subjects for discussion: Mining, use of explosives in mines; use of electricity in mines; mining at great depths; labor-saving methods as applied to mining. Metallurgy: progress in metallurgy; progress in the metallurgy of iron and steel since 1899; application of electricity to metallurgy—(*a*) chemical, and (*b*) mechanical; progress in the metallurgy of gold; recent improvements in the dressing of minerals.

THE Congresses of the Paris Exposition also include the first International Congress of Philosophy which will be held from the 2d to the 7th of August. There will be four classes: (1) general philosophy and metaphysics (2) ethics, (3) logic and (4) history of the sciences and history of philosophy. Under the third class especially a number of topics of interest to men of science are proposed for discussion.

AN International Congress of Ethnology will be held in connection with the Exposition, on August 26 to September 1, 1900. There will be seven sections, dealing respectively with general ethnology, sociology and ethics; ethnographical psychology; religious sciences; linguistics and palæography; sciences, art, and industries; descriptive ethnography.

THE *British Medical Journal* states that an attempt is being made to ascertain in which house in the Hotwell it was that Humphrey Davy discovered the anæsthetic powers of nitrous oxide. It is a well known fact that Davy was assistant to Dr. Beddoes, who had, in 1798, opened a house called the Pneumatic Institute for the treatment of disease, and more particularly phthisis by the inhalation of some of the then newly discovered gases, the Hotwell at Bristol being then a very popular watering place. Davy, it appears, was in the habit of administering the nitrous oxide to all comers at 2d. a dose, and from all accounts it was a popular amusement to go to the Institute and have the gas; the usual modern accompaniment of tooth drawing was omitted. The Institute appears from Stock's memoir of Dr. Beddoes to have been in Hope Square, but the common report puts it in Dowry Square. The Clinton Antiquarian Society, who are pursuing the investigation, hope to put a tablet on the house commemorating the fact that nitrous oxide was there found to have anæsthetic powers.

PROFESSOR WILLIS L. MOORE, Chief of the U. S. Weather Bureau, has with the approval of the Secretary of Agriculture drafted a bill which has been introduced by the Hon. James W. Wadsworth in the House of Representatives. Professor Moore thus summarizes its chief features: It apportions appointments among Senators, Representatives, and Delegates, without regard to their political faith. It provides that candidates shall be nominated by the representatives of the people, under such rigid restrictions as to age, physical condition, and education as render it difficult, if not impossible, to effect the permanent appoint-

ment or the promotion of an unfit person. It prohibits the use of political or other influence to secure promotion or assignment, and I believe properly coördinates the prerogatives of Congress and the executive officers of the government in the matter of the appointment to and the control of the federal service. It places each employee strictly upon his merits and compels him to work out his own salvation, while the present law leaves all this to the caprice of the executive officer or the rules of a commission. It prohibits the removal of any employee for political reasons, and makes his tenure of office secure so long as his services are advantageous to the government, *and no longer*. Without one cent of expense to the Government, it provides for the separation from the public pay rolls of disabled or aged officials, and at the same time provides support in their hours of need.

Professor Wm. E. Hoyle, in the *Library Association Record* of November, speaks as follows of the *Concilium Bibliographicum* of Zurich and its work: "Zoologists are deeply indebted to Dr. Field for the self-sacrificing energy with which he has unstintingly devoted his time and his money to the advancement of the bibliography of their science, and it is not a little surprising that the Royal Society, which is maturing schemes for a card bibliography of the whole of science literature, should not have taken counsel with the only man who has had extensive practical experience of this kind of work. There is no doubt that when the admirable qualities of the catalogue become more widely known in England, more and more zoologists will subscribe to it and provide themselves with the cards bearing on the subjects of special value to them. Few private individuals will take the whole catalogue, unless they are prepared to spend time upon it and to provide ample space for it. It will be much more suitable for University and City libraries, the great storehouses of bibliographical information, to become subscribers and take full charge of all the cards. An attendant would then be entrusted with their arrangement and would be quickly able to direct any inquirers to the right part of the catalogue, which would be kept intact and securely fixed on rods like other card catalogues with which we are already familiar."

The class in Soil Physics at the University of Illinois as a part of their laboratory work, have undertaken a special study of samples of soil taken at different depths from two plats of ground. One of the plats has been subjected to a continuous cropping of corn for twenty-four years, and the other to a rotation of corn, oats, and oats and clover, for the same length of time, neither receiving any addition of fertilizers during the period, and all of the stalks and straw in case of the grain crops being each year removed from the plants. The results of the examination so far show that there has been a marked loss of humus in the soil which has been subjected to constant cropping of corn. This loss is greatest in the surface nine inches of the soil and amounts to more than 50 per cent. of the entire humus content as compared with that of the rotation. This loss of humus is evinced by a decrease in the producing capacity of the soil, which is now only one-third to one-half of that of average Illinois soils under ordinary farm conditions. It is also shown by a marked change in the color and physical texture of the upper layers of the soil, the soil being of a lighter color owing to the loss of organic and vegetable matter and to the ultimate soil particles being apparently reduced in size, which gives the soil an increased capillary power.

We learn from the London *Times* that with a view of making the law on the subject of wild bird protection uniform throughout the metropolitan police district, the London County Council intends to apply to the Home Secretary for the issue by him of a new order under the Wild Birds Protection Acts in regard to the County of London. Under the proposed new order the time during which the killing and taking of wild birds is prohibited by the Act of 1880 is extended so as to be from February 1st to August 31st. During the period from September 1st to January 31st the killing or taking of certain birds is also prohibited. These will, therefore, be protected during the whole year. The list of birds so protected includes the chaffinch, cuckoo, goldfinch, honey buzzard, gulls, kingfisher, lark, landrail, linnet, martin, swal-

low, nightingale, starling, swift, wren, magpie, garden warbler, owl, and redstart. A further effect of the order will be that all wild birds will be protected on Sundays during the whole year. The Parks Committee of the Council think this a most necessary step, as Sunday is the day on which the bird-catcher and cockney sportsman have the greatest opportunity of carrying on their operations. Another clause of the order adds the names of several birds to those in the schedule of the Act of 1880. The effect of this is to increase the penalty with regard thereto, as any person convicted in connection with the scheduled birds is liable under the Act of 1880 to a penalty in each case of £1, whilst for wild birds not in the schedule the penalty is by that Act fixed at 5s. in each case. The birds now to be added to the schedule of 1880 are the bearded tit, buzzard, chaffinch, honey buzzard, hobby, kestrel, magpie, martins, merlin, osprey, shrikes, swallow, swift, and wryneck. Under the last clause of the order it will be an offense to take or destroy the eggs of any of the birds set out in the schedule attached. Included in this schedule are the cuckoo, goldfinch, kingfisher, linnet, lark, magpie, martins, nightingale, starling, swallow, wren, redstart, and swift. The common house and hedge sparrow apparently receive no special protection under the order, except that provided by the close time from February 1st to August 31st.

DR. BURRILL, of the University of Illinois, has sent to Dr. Reynolds, Health Commissioner of Chicago, a report of bacteriological investigations upon the waters of the Illinois and Michigan canal and of the Illinois and Mississippi rivers, altogether extending from Chicago to St. Louis. The report covers the months of June, July, August, September, October, and November, and gives the monthly average number of bacteria found in a cubic centimeter of water taken from each of thirty-eight stations. The laboratory work was done by Mr. James A. Dewey. The figures, as tabulated, show that the whole stream has been, during the time, greatly polluted, but they also show that the water becomes rapidly purified as it flows along from the source of contamination. At Ottawa and LaSalle the number of bacteria has decreased from several million to a few thousand in a centimeter of water. Above Peoria the stream is nearly free from these organisms. Below this city the numbers rise again so as practically to equal those in the canal at Bridgeport. Farther down, the water again becomes gradually less infected, so that at the mouth of the Iliinois there are less bacteria than occur in the waters of the Mississippi river.

WE learn from the London *Times* that at a recent meeting of the Departmental Committee on Preservatives and Coloring Matters in Food, Mr. J. Kellitt, of Liverpool, speaking on behalf of the Grocers' Federation, said that it was now absolutely necessary to use borax or boracic acid for ham, bacon, and butter, on account of the great demand for a mild-cured article. Borax, in his experience, was the most effective preservative he had known, especially for stopping fly-blow. Quite 75 per cent. of the hams and bacon sold in this country were treated with the preservative. After the bacon or ham had been prepared for cooking by the consumer most, if not all, of the borax had disappeared, so that in actual consumption the percentage of boracic acid present at the time the article was consumed must be small. Captain T. W. Sandes, who had started a creamery in county Kerry for the benefit of his tenants, said that he used generally to send to England butter that they called saltless—that is, butter that was cured with one pound of preservative to the hundredweight of butter. The preservative he used was boracic acid. The saltless but preserved butter was bound to be good butter, because impurities could be so easily detected in it, whereas the heavy salted butter need not be, as the salt, more or less, covered a few of the 'sins' in the butter. Mr. J. Wheeler Bennett, who appeared on behalf of the London Chamber of Commerce, said that the trade in Canadian hams had increased since 1889 from something like $300,000 to $1,800,000 in 1898, and this he attributed to the use of preservatives. If the treatment of hams by borax were prohibited, the whole of this gigantic trade from Canada would come to an end. There was a very large and increasing trade in Australian butter, and that trade hinged upon the use of borax, the

butter being washed in a solution of the preservative. The committee then adjourned.

UNIVERSITY AND EDUCATIONAL NEWS.

On December 20th, the University of Pennsylvania's free museum of science and art at Philadelphia, one of the late Dr. William Pepper's cherished hopes, was formally opened in the presence of several thousand people. Immediately following the presentation to the board of trustees of the museum, a bronze statue of the late Dr. Pepper, the gift of friends, was unveiled. The presentation speech was made by ex-Senator George F. Edmunds, in behalf of the Dr. Pepper testimonial committee. In connection with his address, Mr. Edmunds was delegated by Mrs. Frances Sergeant Pepper, the widow of Dr. Pepper, to present to the university trustees, as her memorial to the memory of her husband, a gift of $50,000 as a fund to carry on the work started by Dr. Pepper.

The Presidents of Harvard University, Columbia University, Johns Hopkins University, the University of Chicago, and the University of California have issued an invitation to sister institutions to a conference to be held in Washington some time in February, 1900, for the consideration of problems connected with Graduate work. The invitation says: "There is reason to believe that among other things the deliberations of such a conference as has been proposed will (1), result in a greater uniformity of the conditions under which students may become candidates for higher degrees in different American universities, thereby solving the question of migration, which has become an important issue with the Federation of Graduate Clubs; (2), raise the opinion entertained abroad of our own Doctor's degree; (3), raise the standard of our own weaker institutions.

The engineering laboratory for Stevens Institute, Hoboken, N. J., provided by a gift of $50,000 from Mr. Andrew Carnegie will be begun at once. The University of Wisconsin will also erect an engineering building, the Legislature having provided $100,000 for the purpose.

It is also announced that the Western Reserve University has received $12,000, from Mr. and Mrs. Samuel Mather for the purchase of books; Wabash College $5,000 from Mrs. W. R. Jones toward a residence for the president; and New York University $2,500 from Miss Anna M. Sandham for prizes in public speaking.

It is said that Mr. James M. Munyon will give $2,000,000 to found an industrial school for orphan girls in Philadelphia on the same general lines as Girard College.

Girton College, Cambridge, is being enlarged at a cost of £40,000.

The main building of Buchtel College, at Akron, O., including the laboratories, library and dormitories, was recently burned. The loss is $100,000, with $65,000 insurance.

Oxford University is planning the establishment of the degrees of Doctor of Letters and Doctor of Science, to be conferred for research work.

The Sheffield University College, England, has not succeeded in making arrangements for the occupation of the site of Wesley College, and it is now proposed to acquire a strip of land adjoining the Botanical Gardens on which to erect a new block of buildings.

Dr. F. W. Bancroft has been appointed instructor in physiology at the University of California.

Mr. Loye H. Miller, of the University of California, goes to Oahu College, Honolulu, H. J., as professor of chemistry and natural sciences.

Mr. J. H. Ridgway, brother of the ornithologist of the Smithsonian Institution, has been engaged as taxidermist at the University of Illinois and is now at work on the museum specimens. Mr. Ridgway has been connected with the National Museum, the University of Iowa, the Iowa Agricultural College, and the University of Ohio.

Professor Röntgen has finally decided to accept the call to the University of Munich.

Mr. A. W. W. Dale, M.A., fellow in classics of Trinity Hall, Cambridge, has been appointed Principal of University College, Liverpool, in place of Mr. Glazebrook, who has retired on his appointment to the office of Director of the National Physical Laboratory.