

which afterwards die, and the fruits split and drop before maturing. It is an advantage to withhold organic nitrogenous manures. The scab attacks lemons and sour oranges and disfigures the foliage and fruit by producing warts. It can be prevented by spraying with fungicides. Sooty mould is a fungus following the attacks of insects and fumigations to kill the insect prevents it. Foot-rot is the most destructive malady and is recognized by gum exudation at the base of the tree. The cause is probably some minute organism and prevention is found by cutting away the diseased parts and washing with fungicides. Melanose is a new disease of all citrous fruits, not yet very destructive, the cause of which is unknown, but Bordeaux mixture is a satisfactory remedy.

#### COMBATTING CARNATION RUST.

THE growing of carnations is a large industry in this country, but is beset with many vicissitudes not among the least of which is the carnation rust. This trouble has been under investigation at some of the experiment stations, and before us lies bulletin No. 100, of the New York Experiment Station, with the title as given above. Mr. Stewart, the author, has tested the germination of the spores of the rust fungus in various substances, and finds, for example, that a 1-100 solution of copper sulphate is much too weak to prevent germination. When common salt is used 1-45 is the strongest solution in which the spores can grow. The spores, on the other hand, are remarkably susceptible to the action of potassium sulphide, a 1-3,000 solution entirely preventing germination. A similar series of results was obtained by soaking cuttings in the above solutions, those in potassium sulphide being unharmed. Attempts to cure rusty plants by spraying with fungicides failed, but good results were obtained in preventing its appearance

upon healthy plants. Rust, it has been shown, will spread among mature plants. It is important that carnation plants be held up from the ground by inverted V's of wire netting. For unknown reasons, some varieties are much more susceptible than others to the rust.

#### POTATO DISEASES UPON LONG ISLAND.

IN addition to his carnation investigations Mr. Stewart has made a study of potato diseases, the results of which appear in Bulletin No. 101, of the New York Station. In addition to the good results following from spraying with the Bordeaux mixture for the blights, notes are given upon an internal browning of potatoes, the cause of which is not determined. The brown spots are entirely surrounded by healthy tissue, and cultures made from the discolored portions produced no growth. Under the microscope the brown spots give no clue as to the cause of the trouble, and it would seem to be physiological and not mycological in its origin. Field experiments indicate that the browning is not transmitted from seed to product, but the discolored tubers are not the best to use for planting. There are several stem blights of potatoes, but Mr. Stewart finds another which seems to strangle the plant and working internally will be a difficult one to check. A new fusarium (*F. acuminatum* E. & E.) is reported.

BYRON D. HALSTED.

RUTGERS COLLEGE.

#### SCIENTIFIC NOTES AND NEWS.

##### ASTRONOMY.

A MEETING was held at Paris last month which will be of the greatest importance to the progress of astronomical science. Each of the four nations whose governments publish elaborate astronomical ephemerides were represented at this meeting. The object of the conference was the discussion of the best system of astronomical constants, with a view to the introduction

of uniformity in the various astronomical ephemerides.

The French ephemeris was represented by MM. Faye and Loewy; the British by Dr. Downing and Dr. Gill; the German by Prof. Bauschinger, and the American by Prof. Newcomb and Dr. Backlund, director of the Russian National observatory. Dr. Bakhuyzen and M. Trépiéd acted as Secretaries.

The delegates succeeded in deciding upon definitive constants of nutation, aberration and the solar parallax. The values adopted for these constants are those deduced by Dr. Gill from heliometer observation of the minor planets Victoria, Sappho and Iris.

The determination of the constant of precession and the formation of a catalogue of standard stars was left to Prof. Newcomb.

There can be no doubt that the introduction of uniformity in the four great national astronomical ephemerides will bring about a great improvement in the reduction of astronomical observations in general, and will do away with a great deal of confusion which now exists.

H. J.

#### THE GREENWICH OBSERVATORY.

WE learn from the London *Times* that the Astronomer Royal, Mr. H. M. Christie, has presented his annual report to the Board of Visitors. The most important event of the year has been the completion of the north wing and central octagon tower of the new Physical Observatory and the reërection upon this tower of the Lassell dome. When finished it will consist of a central octagon tower surmounted by a dome, from which will radiate four wings running due north, south, east and west, built of red brick faced with terra cotta. The completion of the east and west wings has now been sanctioned, and provision has been made in the estimates for commencing the work during the present year. Within the dome upon this handsome new building will eventually be placed the 26-inch photographic telescope presented to the Royal Observatory by Sir Henry Thompson, and now nearly finished and ready for inspection at Sir Howard Grubb's works in Dublin. As a guiding telescope the old Merz 12 $\frac{3}{4}$ -inch telescope, which used to be called the Great

Equatorial, and that not many years ago, will be remounted, and in place of a counterpoise on the other side of the declination axis will be mounted a Cassegrain reflecting telescope of 30-inch aperture, also the gift of Sir Henry Thompson, for which Dr. Common has undertaken to figure the mirrors and to supervise the construction. Another handsome new building also built of red brick and terra cotta, with its dome, was completed early in January, and houses the altazimuth, or universal transit circle, which will very shortly be ready for use. The lighting of this dome, as well as that of the old Lassell dome, by a series of port hole windows clearly points to the Argus-eyed character of the instruments within.

The report contains important details regarding the management and scientific work of the observatory. In concluding his report the Astronomer Royal says: "The reorganization of the staff of the Observatory which has been referred to in the two last reports, and which has now been approved, will provide the much needed increase in the permanent staff of trained observers and in the supervising power by the appointment of an additional chief assistant. The benefit of this increase of permanent staff will, it is hoped, be felt in the future, but during the past year the work of the Observatory has had to be carried on by a reduced staff, there being three vacancies in the staff of five second-class assistants which could not be filled up, as under the scheme now sanctioned six established computers are to be appointed in lieu of three second-class assistants. Under these difficult circumstances (aggravated by the inconvenience arising from the building operations in progress) it is highly creditable to the assistants and computers that the record of work for the past year compares so well with that of any previous year, and I take this opportunity of acknowledging the zeal and energy with which the whole staff has worked to maintain the credit of the Observatory."

#### GENERAL.

PROF. W. L. ELKIN, of Yale University, has been elected by the Yale Corporation director of the observatory.

THE division of ornithology and mammalogy

of the department of agriculture will after the first of July be entitled the Biological Survey, at the head of which Dr. C. Hart Merriam will remain. An important part of the work of the Survey will be the determination of zoological and botanical zones, which have already proved so important economically and scientifically.

THE United States Fish Commission steamer Albatross, with the Bering Sea Commission, created to make an exhaustive study of the life and condition of the fur seals in Bering Sea, sailed from Seattle, Wash., for the north, on June 24th.

ACCORDING to the plans of the Geological Survey for the field work of the present season, five parties will work throughout the summer in the New England States and eastern New York, five in the Appalachian region, two in the coastal plain from the mouth of the Hudson to the Gulf of Mexico, five in the interior or Mississippi region, four in the Rocky Mountain region, and eight in the Pacific region.

THE new library of Pratt Institute, Brooklyn, was dedicated on the afternoon of May 26th with addresses by Mrs. Margaret Deland, Truman J. Backus and Melvil Dewey. Charles M. Pratt, President of the Trustees, made an interesting statement of the work of the library. The cost of the building was \$190,000. It is finely appointed in every respect and admirably adapted to its purpose. The new iron stack has been pronounced by many the most attractive and satisfactory of any yet built.

WE regret to record the death of Sir Joseph Prestwich, professor of geology at Oxford University. He was born near London on March 12, 1812, and was educated at University College, London. He was President of the Geological Society, 1870-72; Vice-President of the Royal Society, 1870-71; President of the International Geological Congress, 1888; Corresponding Member of the Paris Academy of Sciences; D. C. L., of Oxford University, etc. He was eminent for his researches in geology and related subjects such as the 'Antiquity of Man,' 'Sub-marine Temperatures,' 'The Water Supply of Cities,' etc.

WE have not hitherto noticed the death of

M. Jules Simon, as he did not himself make contributions to science. His philosophical publications are, however, of value, and he accomplished much for the advancement of science in France. In view of the conditions of political life in America, France may be congratulated that it could have for Premier and for one of its most prominent statesman a man such as Jules Simon.

ACCORDING to the annual custom, the second of the receptions of the Royal Society, which was held at Burlington House on June 11th, was a ladies' *Conversazione*. The exhibits were in large measure the same as at the preceding conversazione, which we have already noticed, and there will further be a public exhibition of a number of these, lasting about two weeks, at the Science Museum at South Kensington.

ACCORDING to the announcement of the publishers, a new scheme for arctic exploration will be described in *Appletons' Popular Science Monthly* for July, by Robert Stein, of the United States Geological Survey. The chief features of the plan, which has been commended by many experienced explorers, are that the work shall be continuous and that it shall have a base of supplies reached every year by the whalers. Mr. Stein accompanies his statement with an interesting map of the arctic regions, showing what has been done by recent expeditions and how much remains unexplored. It is proposed to initiate the new undertaking in 1897.

DR. PAUL M. JONES, instructor in natural history and geology in Vanderbilt University, is spending the summer on the southern coast of Florida, studying the marine life of that coast and of the Bahama Islands, and collecting specimens for the biological museum and laboratory of the University.

ADVICES received at London from Berbera, East Africa, under date of May 25th, show that Prof. Daniel Elliot, who left London in March last for Somaliland, has returned to Berbera from the Eolas Mountains. He intends to start at once for the interior with a large caravan. All his party are well. He has thus far met with much success in his search for specimens of the fauna of the country for the Field Museum at Chicago. Some of the ani-

mals obtained by him and prepared by the taxidermist of the party are very rare.

THE periodical comet discovered by Mr. W. R. Brooks on July 6, 1889, whose orbit has been computed by Dr. S. E. Chandler, Prof. Chas. Lane Poor and others, has been detected by M. Javal, one of the assistants of the Observatory of Nice.

THE Josselin Botanical Society of Maine will hold its second annual meeting at Farmington on July 7th to 10th, 1896. The first two days will be devoted to the reading of papers and discussions and the last two to field expeditions in the surrounding country. Further details regarding the meeting may be obtained from the Secretary, Mr. M. L. Fernald, Cambridge, Mass.

In an article contributed to the *Naturwissenschaftliche Rundschau* Dr. L. Fomm, of Munich, states that he has secured interference effects with the X-rays and has found their length to be about 0.000014 mm.

DR. CHARLES MARGOT has recently investigated (*Arch. des Sciences phys. et nat.*) the curious colors of the alloys of aluminium. White metals usually give white alloys, but 78 parts of gold and 22 parts of aluminium give an alloy of a brilliant purple color, and 72 parts of platinum and 28 parts of aluminium give a bright yellow alloy. The author holds that these alloys are true chemical combinations. They might prove useful for coins, except that the structure is crystalline and the alloy turns to powder when struck by a blow.

M. A. RIVOIRE has recently described before the Paris Academy an instrument that automatically transcribes a composition played on the piano. The record is said to be as legible as the ordinary musical notation, and it might be an advantage to a composer to directly record his compositions. It would also show the exact rate at which a composer or performer plays a given piece, our ordinary musical notation being deficient in this respect.

AN English magistrate has recently decided that it is illegal to sell green peas colored with copper sulphate. It is said that about twenty

million tins containing these peas are consumed annually in Great Britain. They are also sold extensively in America, and the makers should be required at least to state the amount of copper sulphate that they contain.

AN expedition for the purpose of boring to a considerable depth into the atoll of Funafuti in the Ellice group (lat. 9° S., long. 179° W.) left Sydney on May 1st, on board H. M. S. Penguin, a surveying vessel, under command of Captain Field, R. N. Prof. W. J. Sollas, of Trinity College, Dublin, and the Geological Survey of Ireland, is in chief charge as geologist, and with him are Mr. Stanley Gardner, of Cambridge, and Mr. Hedley, of the Australian Museum, who will be doing biological work and collecting. The department of mines of the New South Wales government is lending diamond drill plant and giving some monetary aid as well, while Prof. Anderson Stuart, Mr. Slee and Prof. David have given much time and thought to the expedition. The main funds are provided by the British Government Grant Committee and by the Royal Society, while the Admiralty are providing a ship to carry men and apparatus from Sydney to the island and back to Fiji, where the expedition will disperse. Although the work is surrounded by many difficulties, and possibly by unforeseen ones which may prevent the carrying out of the complete program, it is hoped that a section through a considerable part of an atoll at sea level may be obtained sufficient to show the constituent rocks, the foundation on which they rest, and possibly the exact method according to which the atoll has been built up. It is hoped that the work may be completed before October.

A REUTER despatch to the London *Times* states that the steam yacht Windward left St. Katharine Docks yesterday afternoon for Franz Josef Land. The Windward, which is now under the command of Captain James Brown, an Arctic explorer of over 36 years' experience, is taking out as ice master Mr. John Crowther, who has already made the return journey to Franz Josef Land on three occasions. All told, her crew consists of 22 officers and men. Since her return from Franz Josef Land the Windward has been strengthened throughout,

has been practically reëngined, and, in order that additional warmth may be secured, has been lined with three thicknesses of felt. She is taking out a very large supply of provisions, a number of sledges, and two additional members to the Franz Josef Land party. The Windward does not go out on this occasion for the purpose of bringing Mr. Jackson home. She will call at Vardö, when, after embarking sheep, coal and live reindeer, she will sail direct for Franz Josef Land. Four or five days after leaving Vardö she will get into the ice belt, which will probably be of 300 miles width. It is hoped she will get through this in about a fortnight, and it is anticipated that she will communicate with the explorers at Cape Flora, Franz Josef Land, on or about July 20th. As soon as the Windward has discharged her cargo she will leave Franz Josef Land with news of the doings of the explorers, and as she is bound, owing to the ice conditions, to sail before August 20th, she may be expected in England by the end of September. About this time next year, if all has gone well, she will leave London again to bring the explorers home.

PROF. WM. H. BREWER contributes to the Yale Scientific Monthly an account of the observations he has made during the past 45 years on earth tremors at Niagara Falls. The heaviest vibrations were on either side and near the Horseshoe Fall. They disappeared in places in the soft shales below the limestone, although they were evident in the harder beds of limestone and sandstones interstrated with the shales. Passing down the river along the brink of the gorge, the vibrations rapidly decreased in intensity, becoming too faint to be perceived between the two suspension bridges, increasing again on nearing the rapids. It is a popular belief of persons living near the Falls that crystals are more common in the rocks there than elsewhere in the same formation. But macroscopic examination of limestones taken near the Falls and those gathered a few miles away did not show that the crystallization or the texture of the rocks had been affected by the jar of the cataract. As Prof. Brewer remarks, it would be interesting to make the investigation microscopically, and to study the jar of the cataract with proper instruments.

#### UNIVERSITY AND EDUCATIONAL NEWS.

THE *Oxford University Gazette* for June 9th contains the eighth annual report of the delegates of the University museum (1895). It will be remembered that two important changes were made during that year, Mr. Francis Gotch having succeeded Dr. J. S. Burdon-Sanderson as professor of physiology, and Mr. Henry A. Miers having succeeded Prof. H. M. Storey Maskelyne as professor of mineralogy. The principal improvement in the museum building during the year was the alteration and fitting up of two rooms in the department of medicine for a pathological laboratory, the cost of the scientific installation of which has been defrayed out of a sum of £500 presented by a benefactor who does not wish his name to be made public. Prof. Sanderson, the Regius professor of medicine, on his resignation of the physiological chair presented to the laboratory instruments to the value of £105, made under his direction during his tenure of the chair, and paid for by him in excess of the departmental income. The fine portrait of Prof. Burdon-Sanderson, painted in 1893 by the Hon. John Collier, has been presented to the department by Mrs. Burdon-Sanderson.

THE June examination under charge of the University of the State of New York was the largest in the history of the department. About 400,000 question papers were required, all of which were printed in the department by its own employees. The preliminary examinations for professional and technical students, and those for license to practice were so large that the accommodations heretofore in use proved insufficient. Besides the 69th regiment armory in New York City it became necessary to use two large assembly rooms in the New York University building in Washington Square.

IN response to an appeal by the Chancellor at the annual banquet of the alumni of Vanderbilt University, twenty-six of those present made subscriptions of one hundred dollars each to endow a chair in the University. An endeavor will be made to increase the amount to \$50,000 within the next year. The annual address before the University body was delivered by Postmaster-General William L. Wilson.