

ing interesting details of his work, and also of his own character and temper. The passage is worth while quoting: "There are two men in me,—the one, timid, self-defiant, and of *humeur facile*, who accepts thankfully good advices and discussion; the other is a great deal less easy to manage. When, after having thoroughly used all the resources of experimental science, I am quite sure of having attained to truth, a second man arises in myself, absolute, very harsh in discussion, and of *humeur farouche*. . . . I am no more in November, 1885, timid, troubled, sleepless, always haunted by the nightmare of rabies. We are in April, 1886. Having called to aid all the resources of experimental science, I am now in possession of the exact scientific truth concerning this question." M. Pasteur concluded in proposing the joint health of America and France, "two nations formerly sisters on the battle-ground." Toasts were next proposed by M. de Blowitz and de Lesseps, and the meeting broke up after mutual expressions of sympathy and good feeling had been freely exchanged.

H. V.

Paris, April 15.

NOTES AND NEWS.

A STRANGE nuisance of rats has developed itself in some parts of New York City, reaching such an extent as to call for an examination of the circumstances by the proper city authorities, and making dwellings almost uninhabitable. These animals are known to possess a remarkable migratory instinct, congregating in large numbers, and overrunning whole regions, to afterward as suddenly and strangely disappear. Dr. Buckland relates instances of their migration from house to house at certain times of the year, influenced probably by the lack or abundance of food. In a certain part of Berkshire, England, there were situated a number of isolated barns on the bleak, barren downs; and the rats were frequently met in colonies at early morning, marching in long lines direct from one barn to another. They were watched, and seen to go directly across the country in a straight line; and the most curious part about the circumstances was the instinct that told them where to go, or to find those barns which contained grain. At Central park there is no unusual number, though they find in spring plenty of food along the lakes in the grain fed to the swans and other aquatic birds. This grain is placed in boxes at some little distance from the water's margin, but the rats are not thus hindered from purloining it: they swim to the boxes, extract the grain, and then swim with it back to the shores. In the winter they collect about the animal houses. In

the Philadelphia zoölogical gardens they have been very numerous, and not a little of a nuisance.

—Mr. Charles Rhodes of Oswego, N.Y., has lately published a circular giving the monthly and annual levels of Lake Ontario at Oswego for a number of years, as determined by records of the army engineers. The variations of level seem to be irregular, and are not well explained. For example, in April, 1873, after eighteen months of low water, the lake rose about two feet and a half in twenty days. When it is considered that the whole inflow of the Niagara during that time would scarcely more than produce the rise, even if the escape by the St. Lawrence were stopped meanwhile, the magnitude of the change may be appreciated, but can hardly be well accounted for. Mr. Rhodes also gives account, in a personal letter, of oscillations in the water of the lake that seem to correspond to the *seiches* of Lake Geneva and other Swiss lakes. He describes sudden flows of the water from Lake Ontario into the Oswego River, with a rise of ten to eighteen inches, followed, in half an hour or so, by an equally sudden discharge and fall, going as much below the ordinary level as the rise had been above it. Smaller oscillations succeed, gradually fading away. All such large and sudden fluctuations are followed by storms of wind, rain, or both. These singular phenomena, so well studied out by Forel in Switzerland, have received but little attention in this country. The records of lake-levels kept by the army engineers would probably afford many examples that should receive investigation.

—At one of the recent sessions of the Prussian Landtag, it was stated that the rigorous laws adopted in 1880, relating to rabid animals, had produced most excellent results. These laws impress the necessity of veterinary examination of all animals suspected of rabies, and if, in any case, the presence of the disease is determined, require that all animals which have been exposed to danger shall be immediately killed. Furthermore, in any district where a rabid cat or dog is seen, it is ordered that all dogs shall be confined or muzzled. As a result of these laws, there has been a steady decrease in the number of mad dogs. In 1880–81, 672 rabid dogs were killed; in 1881–82, 532; in 1882–83, 431; in 1883–84, 350; in 1884–85, 352. During the first of these years (1881–82) 2,400 other dogs, which had been exposed to the danger of contagion, were killed; in 1884–85 the number was 1,400. The number of human deaths has decreased in the same ratio: thus in 1880–81 there were ten; in 1881–82, six; in 1882–83, four; in 1883–84, one; and in 1884–85, none.

—The Smithsonian institution received last week a foetal pygmy sperm-whale (*Kogia breviceps*) from Mr. George Sayers, keeper of the Sea Island city life-saving station, New Jersey. It has been discovered that this species of *Kogia* breeds at this time of the year. Last May a specimen was also sent to the institution. Early this winter a female of this species was received, containing the smallest foetus of this cetacean ever found, not more than six weeks old.

—The naturalists of the fish commission steamer Albatross, which is now engaged in taking soundings among the Bahamas for the hydrographic bureau of the navy department, have recently sent home a part of their collections in this locality. Besides several new species of birds, the collection contains a number of specimens of Kirtland's warbler, which, ornithologists will remember, is a very rare species to our fauna. Very few specimens have ever been taken within the limits of the United States, and it is not until recently that its habitat has been discovered; in this locality, however, it is found in abundance. The Albatross will return from her work in the Bahamas on or about the 12th of this month.

—The off-shore seal-fishery of Newfoundland this year has not proved a success. The largest fare taken was about 34,000 seals; the average, less than 12,000; the total, about 163,300, divided among fourteen vessels. The fine steamer *Resolute* was driven by the ice upon a reef north-east of Fogo, and is a total loss. Once in every ten or fifteen years it happens, that, owing to the prevalence of easterly winds, about the time for taking the young seal, the ice on which they are is driven landward, and forced, a compact mass, into the northern bays, where vessels cannot follow. The residents along the shore then reap a harvest as long as the wind is favorable and the ice clings to the land. It is estimated that from 100,000 to 150,000 seal have been taken in this way this season, which is a godsend to the people, who are mostly very destitute. In some places the land-catch has averaged thirty per man, each worth about two dollars, of which the captor owns the whole; while on the steamers the owners of the vessels receive one-third of the catch.

—In a communication before the French academy of sciences on April 12, M. Pasteur stated, that, of the 726 persons treated for hydrophobia by him up to that date, 688 were bitten by mad dogs, and 38 by mad wolves: among the former there had been one, among the latter three deaths. From a collection of cases in man from the bites of mad wolves, he finds the percentage of mortality as high as 82, and the duration of

incubation much shorter: he therefore concludes that there is greater virulence in the poison from this source. Instead of three deaths so far, among those bitten by the mad wolves, he believes that there should have been fifteen or sixteen, had his treatment been ineffectual.

—A lively discussion on the subject of the poisonous mussels of Wilhelmshaven (*Science*, vii. 175) yet continues in the German medical periodicals. From the conclusions already reached, it appears evident that simple stagnation of seawater is capable of giving rise to poisonous qualities in the animals inhabiting it; and that, too, when the water may be uncontaminated by sewage or other impurities. Poisonous qualities precisely similar to those of the mussels have been observed in the star-fishes of Wilhelmshaven. The poison in the mussels has been isolated, and described as a ptomaine under the name of mytilotoxin; but Professor Virchow says it cannot be a true ptomaine, as it is not a product of decomposition. A large share of attention has been given, by the various writers on the subject, to the question whether these mussels are of a new and introduced form or not. It is generally agreed that they are not, yet there seems to be tolerably constant differences from the true *Mytilus edulis*, probably due to the conditions in which they grow. Professor Virchow adds a point of practical importance; viz., that the experienced fishermen of Christiania warn consumers against the use for food of mussels and oysters which have been attached to ships' bottoms, old wood-work, etc.

—The new microscope objectives, of which notice was given in *Science*, are more fully described in the last number of the Journal of the Royal microscopic society. They are receiving high praise, — 'the microscope of the future,' as Professor Abbe calls them, — and it is believed that high-power work hereafter will almost necessarily be done with them. The two $\frac{1}{4}$ objectives which have been received in England are composed each of ten single lenses, combined to form five separate lenses, with a single front lens; but the special point in their construction is that they are made of the new kind of optical glass which Professor Abbe and Dr. Schott have been working for the past five years to perfect. Of the ten lenses, two only are of siliceous glass, the other eight being made of borates and phosphates. The crown and flint glass ordinarily used by opticians does not contain more than six chemical elements, while the new glass contains no less than fourteen. This glass was discovered nearly three years ago, and objectives were then made

by Zeiss; but, as it was decided to establish a manufactory for the production of the glass with the aid of the money — \$15,000 — voted by the Prussian government, Messrs. Zeiss were obliged to abstain from using it until it should be accessible to other opticians also. In a few months it is expected that the preparation for the supply of the borates and phosphates, as well as the siliceous glass, will be perfected, when both objectives and glass will be obtainable in the usual way. Mr. Nelson, who has examined one of the objectives, writes thus: "The great benefit which will accrue to microscopists from the use of lenses of this construction will be due, not so much to the absence of color, as to the greater freedom from spherical aberration. . . . It is decidedly the most brilliant objective I have ever seen."

— The department of physical education in Amherst college has lately included among its statistics those relating to the condition of each student's eyes upon entering college. The summary of the results obtained from the examination of the classes of 1888 and 1889, comprising 199 men, shows a larger percentage of impaired visual organs than might be expected. In the following table the percentages are given for the two classes combined.

Perfect vision, in both eyes, 14.0; in one eye.....	13.0
Far-sighted, " " 36.5; " "	8.0
Near-sighted, " " 15.5; " "	8.0
Astigmatic, " " 15.0; " "	7.0
Other defects.....	1.0
With good color-sense.....	93.5
With feeble color-sense.....	3.5
Partially color-blind.....	1.0
Completely color-blind	1.5
With blue eyes.....	54.0
With brown eyes.....	32.0
With gray eyes.....	13.5

The percentage of those with perfect vision in one or both eyes was nearly the same in both classes; but a considerable variation was observed in the number of the far-sighted, near-sighted, and those with imperfect foci (astigmatic).

— Mr. Scudder's 'Systematische übersicht der fossilen myriopoden, arachnoideen und insekten,' from Zittel's 'Handbuch der palaeontologie,' is a valuable *résumé* of our present knowledge of fossil insects, and one which fills a long-felt want. It is richly illustrated with excellent figures of the principal forms, and contains a concise and careful summary of the extinct genera. Entomologists, to whom the work should have its greatest value, will be glad to learn that it will shortly be published in English.

— The additions to the literature of bacteriology during late years have become so extensive and numerous that even the specialist can hardly keep

pace with the publications constantly appearing. For this reason the new "Jahresbericht über die fortschritte in der lehre von den pathogenen micro-organismen" (Braunschweig, *Bruhn*, 1886), by Professor Baumgarten, will be welcomed by all those interested in this broad field. The first volume, for 1885, is a work of one hundred and ninety-two pages, comprising bibliographical lists of the separate papers and volumes that appeared during the past year, with abstracts of their contents, under the titles, 'Text-books and compendiums,' 'Parasitic micro-organisms (including micrococci, bacilli, actinomyces, and pathogenic spirillae, hyphomycetae, and protozoa),' 'Saprophytic micro-organisms,' and 'General technique.' The work cannot help but be very useful to both biologist and physician.

— The Société philomathique of Bordeaux has organized an international congress on technical instruction, which will be opened on Sept. 20 next, at Bordeaux.

— The falling-off in the average size of families in France, as shown by recent statistics, has induced the enactment of a decree re-affirming the law whereby every father of a family having seven living children may have one of his sons educated at the expense of the state.

— The Spanish Royal academy of sciences has offered premiums for papers on bird migrations and habits, as observed in the littoral and central regions of the peninsula. The particular subjects to which attention is directed, as given in *Cronica cientifica*, are very similar to those proposed by the bird-migration committee of the American ornithologists' union.

— Dr. E. Reyer of Vienna, who made a geological tour through this country two years ago, has lately published two profiles through the Sierra Nevada in a supplement to the *Neues jahrbuch für mineralogie*. He finds the evidence of faulting, down to recent dates, very distinct on the eastern slope of the range, even glacial striae being displaced at many points, and the downthrow nearly always being on the eastern side of the fracture. The eruptive masses, by which the sedimentary strata of the range are much disturbed, are generally regarded as younger than the sediments. Dr. Reyer modifies this view by supposing them to be older than the oldest strata which lie conformably upon them, although greatly disarranged from their original attitude by massive eruption-like overturnings. In the down-faulting origin of the Yosemite valley, and in many other points, he confirms the views of Professor Whitney.

—The summer course in entomology and general invertebrate zoology, of Cornell university, will begin Monday, June 21, next, and continue ten weeks. After completing an elementary course in either general zoology or entomology, the student may select some subject in systematic zoology, economic entomology, or insect anatomy, for special investigation. It is planned to have the work of each student, as far as possible, an original investigation. Members of this class will have free use of the library, and all other privileges of students of the university. Those desiring to join the class should make application to Prof. J. H. Comstock, Ithaca, N.Y., before June 10.

—From the returns of the German quinquennial census, in December last, it was found that Prussia has a population of 27,279,111, an increase of 3.79 per cent; Bavaria, 5,284,778, an increase of 2.49 per cent; Saxony, 2,972,805, an increase of 6.94 per cent, the largest of any of the states, the returns of which are so far available. In only a few provinces has there been a decrease; Pomerania, with 2.22, being the most important.

—The cold weather during the past winter in Florida, has, Dr. Riley finds, destroyed the injurious orange scale insects wherever it was severe enough to cause the shedding of the leaves. The eggs, however, were uninjured.

—The journal of the Society for psychical research for April contains a second instalment of Mr. Myers's 'Notes on the unconscious self,' which is principally devoted to answering the criticisms of Hon. Roden Noel on Mr. Myers's previous papers. Some interesting anecdotes on the general subject of mesmerism are given by C. Kegan Paul, the well-known publisher, and his sister. At a general meeting of the society, announced for the evening of May 3, Mrs. Henry Sidgwick was to read a paper on spiritualism, which was looked forward to with great interest.

—In tables just published by the U. S. geological survey, Mr. J. D. Weeks gives the total production of manganese ores in the United States during 1885 at 23,258 tons, with over seven thousand additional tons of manganiferous iron and argentiferous manganese ores. For the year 1884 there were 10,180, for 1882 only 4,532 tons. This includes only those ores containing over 44 per cent of metallic manganese.

—The small island Juan Fernandez, where Alexander Selkirk passed his four years of solitude, has been leased by the Chilean government to a Swiss named Rodt, who has established there

a flourishing colony. M. Rodt exercises the powers of a viceroy, and has the fullest administrative authority. The chief occupation of the inhabitants is agriculture, but some branches of manufacturing industry are also practised. M. Rodt encourages immigration, and among the new Crusoes are to be found Austrians, Englishmen, Frenchmen, North and South Americans, South Germans, Swiss, and Spaniards. There are no Prussians, the governor having a rooted antipathy to Prussia.

—The tenth anniversary of Johns Hopkins university was celebrated April 26. The statistics show that the whole number of students admitted since its foundation is 923, of whom 19 have died. Addresses were made by Profs. W. H. Welch, and H. A. Rowland, and others.

—The Smithsonian has received the first evidence of the successful introduction of salmon in the head waters of the Potomac. Last week Mr. R. A. Golden, a fish-dealer in the Washington market, presented a fine specimen of the Sebago salmon to the institution, measuring over one foot in length. It was caught in a trap-net at Ragety Point; and the presence of this well-grown specimen in the Potomac waters is an earnest of what may be looked for in the future. The introduction of land-locked salmon in this river marks an important era in the progress of fish-culture and the success of the U. S. fish commission.

—The proposition to establish a national military and naval museum in Washington appears to be regarded with general favor. The plan proposed is to erect a building on the Smithsonian grounds for this purpose, the museum to be under the supervision of the Smithsonian. This plan would doubtless commend itself to congress more forcibly than would the proposition to erect a large separate building in another part of the city. The army and navy museum would be quite distinct from the other departments of the national museum, and would be placed under the control of representatives of the two services upon which it must depend for growth and development.

—The vessels belonging to the U. S. coast survey were assigned to duty last week. The *Palinurus*, Lieut. D. D. V. Stuart commanding, is stationed in Long Island Sound; the *Eagre*, Lieut. C. P. Perkins, in company with the *Daisy*, will proceed in a few days to the North River, to complete the work begun last year by the *Palinurus*. This work will take until the middle of July, when the *Daisy* will be employed along the shores of Staten Island. The *Eagre* will then begin operations in the East River at a point midway

between Hell Gate and Blackwell's Island, working by degrees through the sound until meeting with the *Palinurus* coming west.

— Some estimate of the signal service as a promoter of original research may be gathered from the fact that two of the three gold medals awarded by the Royal geographical society were secured by Lieutenant Greely and Sergeant Brainard, for geographical discoveries. Professor Langley was awarded the Draper medal by the National academy, for discoveries at Mount Whitney; and the Royal society of science, letters, and arts, has made Lieutenant Finley a member with its highest honors, for his original work on the subject of tornadoes, all of which was under the direction of the signal service in its legitimate duties.

— The secretary of state has forwarded to the house of representatives a letter from the American minister at Paris, enclosing an invitation to the United States to be represented at the convention of the Philomathical society of Bordeaux, France, to be held Sept. 1. The purpose of the convention is to consider all questions relating to commercial and industrial education. A letter from commissioner of labor, Wright, suggests the following gentlemen as delegates: Prof. C. M. Woodward of the St. Louis manual training school, Prof. W. P. Atkinson of the Massachusetts institute of technology, and professors from the Columbia school of mines and Stevens institute.

— Alfred Rabaud, founder and president of the Geographical society of Marseilles, died on April 12, aged fifty-eight.

— Reymond communicates some interesting notes as to the geology of the region of the great African lakes, especially of the south-east part of the Tanganyika and Nyassa basins, from specimens collected by Giraud. The region appears almost exclusively composed of primitive rocks. The only sedimentary rocks collected were from south of Tanganyika, at Yendivé station, and from Mpsa, two or three days' march from the northern end of Lake Nyassa to the north-west, on the route between the two lakes. These rocks are of a schistose character, contain *Cyrena* and remains of *Lepidosteus*, and are referred by Reymond to the upper cretaceous or lowest tertiary age. This agrees with what is known of the geology of Africa in general, where the cenomanian and nummulitic strata alone are found resting on a vast denuded plateau. The beds of brown iron ore, which cover a very large extent of country, and are worked by the natives, are supposed to have been leached out, as it were, from the crystalline rocks, by the action of the water and car-

bonic acid held in the vast bogs and spongy marshes of the region. One of the chief characteristics of central Africa is the absence of calcareous formations. The metallic wealth of the country, except for iron, is little known; but Giraud reports copper rather abundant between Bangweols and Luapula. In South Africa the sedimentary beds are of greater extent, and contain a considerable amount of coal of inferior quality. The collection of fresh-water and land shells made by Giraud comprises, according to Bourguignat, ninety-three species and several new forms.

— What appears to be a justifiable complaint against the delay in printing scientific reports is made by Commissioner Colman to the senators and representatives. Of the forty-five thousand copies of the first annual report of the bureau of animal industry, ordered nearly two years ago, scarcely a twentieth part have been so far delivered by the printer. Another work, Riley's report on the cotton and boll worm, long since ordered, and in the printer's hands, has not yet been delivered, though stereotyped for nearly a year.

— In a recent letter to Professor Riley, U. S. entomologist, Mr. J. Birkbeck Nevins of Liverpool gives an analysis of dried locusts from observations made by Edward Davis, president of the Liverpool literary and philosophical society, as follows:—

	Without wings.	Wings developed.
Phosphoric acid (P_2O_5).....	1.92%	1.89%
Tribasic phosphate of lime.....	4.21%	4.13%
Nitrogen.....	10.14%	10.64%
Ammonia.....	12.31%	12.92%

This shows that these dried locusts are as rich in nitrogen as meat, guano, or dry blood, and contain enough phosphoric acid to greatly increase their value as a manure which English authorities estimate at about twenty-five dollars per ton.

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.*

Science at Cornell.

WILL you allow space to one who has known Cornell from the beginning, who has watched her progress with the greatest interest, and who knew personally Mr. Cornell and President White, for a few comments upon recent letters in *Science* in regard to 'Science at Cornell'?