Current Topics and Events.

ATOMIC projectiles have been used by many investigators to batter down the defences which have guarded so well the innermost mysteries of the structure of matter. The α-particle, liberated spontaneously in radioactive transformations, has, thanks to its enormous velocity, been of special service in elucidating the constitution of the atom. In these investigations no one has played a more important part than Sir Ernest Rutherford, and it is, therefore, appropriate that in the address which appears as a supplement to this issue of NATURE he should give an account of the life history of such a high-speed α-particle. When the particle is expelled from a radioactive substance, it has been proved to be the nucleus of a helium atom of mass 4 carrying two positive charges of electricity. Recent experiments by Henderson have shown how, by the successive capture of electrons, the α-particle becomes a neutral helium atom. The experiments, which were carried out by observing the deflexion of a narrow pencil of α-rays in a magnetic field, have been confirmed and extended by Sir Ernest Rutherford. It appears that not only may the doubly charged helium nucleus remove and capture an electron from the outer electron structure of the atoms in its path, but the converse change may also take place. In passing through other atoms this electron may be knocked off, and the singly charged α-particle revert back to the doubly charged type. The somewhat unexpected conclusion is reached that this process of capture and loss may repeat itself more than a thousand times in the flight of the particle. Similar considerations apply in the case of singly charged and neutral helium particles. Though the results of these encounters may be less startling than those in which disintegration of an atomic nucleus like that of nitrogen or of aluminium occurs, it seems probable that the study of these rapid interchanges of charge will yield information of great value to the theoretical physicist.

THE attempt to restrict the spread of epidemic disease amongst plants is creating a phytopathological service of inspection in many countries, and legislation is gradually restricting the free movements of plants and plant produce in and out of the various countries. In a paper under the title "The Biological Basis of Plant Quarantines" contributed to *Phytopathology* for June, W. A. Orton and R. Kent Beattie attempt to get down to the first principles underlying such legislation, and their views deserve careful study in Great Britain, both by growers and students of pathology, as, if the conclusions arrived at find favour in the United States, the British exporter of plants may experience increasing difficulties in the way of export trade with that country. The authors draw a fundamental distinction between communications between countries that are close neighbours, and traffic in plants across the ocean barriers that separate continents. They conclude that within the area of a continent the cultivated host plants and their parasites will in most cases have fought out their battle and arrived at an approximate equilibrium, the issue of the conflict varying of course each season, but without violent fluctuation. When, however, a parasite crosses an ocean barrier, then its arrival in the new continent may be followed by incalculable results, and a cultivated crop may almost be exterminated before selection of more resistant forms, or other factors operating over a space of time, have again produced an equilibrium in which the cultivation of the crop is economically possible, allowing for the average loss produced by this parasite. These results may follow, even when the parasite thus introduced is one regarded as relatively innocuous in the continent where it has long been known. For example, chestnut bark disease, *Endothia parasitica*, though a relatively minor trouble in Asia, has, since its introduction to America, bid fair to destroy all the chestnut forests of the country. The author's arguments bring them into disagreement with the conclusion of the last International Phytopathological Convention, held in Rome in 1914, as they emphasise the importance of "common species of long-standing dispersion" which inspecting officials naturally tend to overlook, and lead them to the very important general principle that "inter-continental trade in plant propagating material is fundamentally dangerous, and to be held within the narrowest limits compatible with economic need."

ONE of the best-known German scientific workers, and at the same time one of the founders of modern physical chemistry, Wilhelm Ostwald, who was born September 2, 1853, at Riga, is about to celebrate his seventieth birthday. After having studied at Dorpat he was appointed, in 1883, professor of chemistry at the Baltic Polytechnical School of Riga, and, in 1887, professor of physical chemistry in Leipzig. Here he developed a great ability as an investigator as well as a teacher. His work gave a firm experimental foundation to the theories of van 't Hoff and Sv. Arrhenius. There, scientific workers from all over the world assembled round the master, and built up, in a short time, the edifice of modern physical chemistry. Besides this work, Ostwald produced a number of valuable text-books, including his large "Outlines of General Chemistry," "The Fundamental Principles of Chemistry," "The Principles of Inorganic Chemistry," and "Scientific Foundations of Analytical Chemistry." At the end of last century Ostwald devoted himself more to questions of natural philosophy, such as the energy resources of the world. These studies, the fight against scientific materialism, and the propagation of Haeckel's monistic philosophy so occupied his mind that he gave up his professorial duties in 1906 and retired to his country seat in Grossbothen, Saxony. It was a token of the breadth and productivity of Ostwald's mind that even then he created for himself quite a new sphere of activity. Starting from the art of painting, which he had loved and cultivated since his youth, he worked out a new system of colour, by which every tint can be

characterised by exact figures. He has expounded the system in various works on colours, and it has already led to the foundation of an institute for colour investigation in Dresden. The numerous pupils and friends of Ostwald rejoice in the work of their leader and offer him their tribute of esteem.

THE second triennial Pan-Pacific Science Congress, which opened at Melbourne on August 13, is being held under the auspices of the Australian National Research Council and with the support of the Commonwealth and State Governments. The first congress was held in Honolulu in 1920, and the third will be held in some other country bordering on the Pacific. The object of these congresses is the promotion of the study of scientific problems of common interest, and the meetings form part of a general plan aiming at the maintenance of harmonious relations between all the countries within and bordering the Pacific region. In addition, therefore, to representatives from Great Britain and various parts of the Empire, distinguished men of science from the United States, Japan, and Formosa, the Netherlands, Dutch East Indies, and other countries are attending the Melbourne congress. Among the subjects under discussion are: irrigation problems; agricultural education and research; genetics, with special reference to the improvement of farm animals; organisation of research among the natives of the islands of the Pacific. (A strong effort will be made to obtain from ethnologists agreement as to a definite and practical scheme for the investigation at once of the fast-disappearing races in those islands in which Australia is especially interested. If such a scheme can be devised it will be laid before the Commonwealth Government with an urgent plea that it be put into effect at once); introduced pests and natural enemies; paper pulp: Australian possibilities; meteorology of the Pacific; terrestrial magnetism in Pacific regions; value of hydrographical work of the Royal Navy, and Australia's responsibility to continue it; survey of the Great Barrier Reef; international notification of animal diseases; hygiene of Pacific Region; fisheries and marine biological stations; parasitological problems, etc. We hope to give an account of the proceedings of the congress in a future issue.

A SPECIAL number of the *Revue Scientifique* was published on July 28, under the title of "L'Œuvre de Pasteur et ses conséquences." We may regard it as the complement of the special Pasteur number of NATURE: but it goes further afield. It contains many articles by writers of great authority: and it represents the devotion of all France to Pasteur's memory. He lived and worked for France, and wore out his life for her. His work was for the good of the world. Still, it was for the honour and glory of France: that was his revenge, after 1870, to set France high above Germany in a vast domain of science. Every year we in Great Britain, though we are grateful to him, are living under this disgrace, that we have no monument or memorial to him, to show our sense of gratitude for all that we have learned from him. Among the articles in this number of the *Revue Scientifique* are two of remarkable interest. One is on the predestined course of his discoveries, "L'Enchaînement des découvertes de Pasteur." There is no end to the wonder of this orderly and inevitable enchainment of discoveries. The other article is "Pasteur et la Maternité." It tells the story of Semmelweis and his defeat: and the story of Tarnier's work, who in one year saw, in the Maternité de Paris, 132 women, out of 2237, die of puerperal fever: indeed, in May, out of 31 admitted for confinement, 30 went out dead. Then, the wearisome debating and theorising, up to that day in 1879, March 11, in the Académie de Médecine, when Hervieux poked fun at the notion that puerperal fever was caused by germs, and Pasteur went up to the blackboard and sketched *streptococcus* on it, saying, "Tenez, voici sa figure." We see, by an advertisement in the *Revue Scientifique*, that copies of Aronson's bust of Pasteur can be had at prices according to size. Surely, some English shops ought to stock this bust. But where is our proper memorial of Pasteur in London?

A SEVERE typhoon was experienced at Hong-kong on Saturday, August 18, and much damage occurred, accompanied with loss of life. The wind is said to have attained a velocity of 130 miles an hour, which is stated to be the highest on record, and the barometer fell to 28·66 in., said to be the lowest reading on record at Hong-kong. In two hours, from 9 to 11 A.M., during the height of the storm the rainfall amounted to about 5 inches. Good notice was given of the approach of the typhoon, which was first reported on August 11, from Guahan, Ladrone Islands, in the North Pacific. The progress of the typhoon was about 270 miles a day to the west-north-west. Later reports fortunately state that Hong-kong has suffered far less than might have been expected, but the typhoon warning was again hoisted on August 20. Typhoons are regularly warned at Hong-kong by those in charge at the Royal Observatory.

IN the *General Electric Review* of America for August there is a complete technical description of the latest broadcasting station in New York. It is termed "Broadcast Central" and operates under the call letters WJY and WJZ. It was opened on May 15 and can be heard by radio listeners on the eastern side of the United States. It has "two channel" operation, so that it transmits two different programmes simultaneously. WJY, called the "jazz" channel, operates on a wave-length of 405 metres and broadcasts popular music, news, lectures, etc. The WJZ channel operates on a wave-length of 455 metres and broadcasts operatic and classical music. Both the studios are on the sixth floor of the Æolian Hall, which is in the centre of New York City. As concerts and recitals are always being given in this hall, arrangements have been made to broadcast them. Special line wires also have been run to the more important theatres and hotels, so that outside performances can be readily transmitted. The antennæ are strung from two 120-foot towers located on the roof at a distance of 175 feet apart and form two

separate four wire horizontal systems separated by ropes and insulators. The length of the wires forming one system is 45 feet, and the length of the other system is 55 feet. As the output of a high-quality microphone seldom exceeds a few millivolts, considerable amplification is necessary. A three-unit motor generator set is used. One of the generators has a 1000-volt commutator at each end, thus giving 1000 volts for the amplifier plate filter and 2000 volts for the transmitter. The equipment is all duplicated, one set being in reserve, so as to reduce the risk of a breakdown to a minimum. From the listener's point of view, this alternative choice of programmes is an attraction, and the operation of Broadcast Central has been extremely successful.

THE *New Phytologist* (vol. 22, No. 3) contains a very stimulating article by Dr. F. E. Clements under the title of " The Ecological Method in Teaching Botany," in which the author's ecological outlook is applied to the problems of teaching with the insistence upon quantitative study of environment, and the response thereto, that has proved so fruitful in his studies of vegetation. This paper should do good if only for its challenge to the traditional methods which hold such unquestioned sway, though many teachers will feel Dr. Clements's ideals—that the student's education should be based mainly upon first-hand investigation, brought into an ordered and correlated form by the method of group discussion, all the work being done " where the plants are, whether this be the greenhouse, garden, field or (much less satisfactory) the ordinary laboratory "—make demands which the staffing and accommodation of most British departments of botany would render impossible. Dr. Clements's distrust of the efficacy of lectures, his challenge to the professors' insistence upon principles as apart from facts, his criticism that the laboratory notebook, save for its indifferent quality, is more suitable to a drawing class, and his objection to the content of the typical elementary class in which morphology is paramount, are points in his paper which might well provoke animated discussion; but there can be little question that a new generation will do well to take a critical survey of the methods and results of the formal lecture and laboratory courses of their predecessors.

APPLICATIONS are invited by the Admiralty for a Junior Scientific Assistant in the Experimental department of the Signal School, the duties being concerned with the application of W/T devices; also for a Junior Scientific Assistant having a good knowledge of general physics, possessing an honours degree in physics or its equivalent, and with some experience in research. Applications for the posts should be sent to the Secretary of the Admiralty (C.E.), Admiralty, S.W.1.

REFERRING to the letter of Dr. G. D. Hale Carpenter on a waterspout with a sheath or sleeve, published in NATURE of September 23, 1922, p. 414, and one on the same subject by Dr. Willard J. Fisher in the issue of November 18, p. 669, Dr. Fisher writes to say that the same sort of sleeved tornado pendant seems to be described by R. Abercromby, in the Quart. Jour. Roy. Met. Soc., 16, pp. 119-126, 1890, as having been observed by Mr. S. Elson, a Calcutta pilot. Possibly the phenomenon is not very uncommon.

THE British Research Association for the Woollen and Worsted Industries announces the following awards for the year 1923–24: Research Fellowships: Mr. Robert Burgess, of Nottingham, to carry out investigations on the damage and deterioration caused by bacteria and fungi on woollen goods and yarns during storage; and Mr. H. E. Farrar, of Leeds, to conduct research on the dyeing of wool with acid and mordant colours. Advanced Scholarships: Mr. S. Menzer, tenable at the University of Leeds; Mr. T. N. T. Graham, tenable at the Scottish Woollen Technical College, Galashiels; Mr. P. M. Redman, of Keighley, and Mr. W. Lee, of Halifax, tenable at the Bradford Technical College.

WE have received from British Drug Houses, Ltd. (16-30 Graham Street, N.1), a specimen of their standard lactose B.D.H., which has been prepared of guaranteed purity for the particular requirements of bacteriologists and biologists. We have tested it with several strains of *Bacillus typhosus*, *B. paratyphosus*, *B. dysenteriæ*, and other micro-organisms, and find that it gives the characteristic and typical fermentation reactions of the respective organisms. One gram incinerated on platinum gave no weighable amount of ash. We therefore believe that the claim made as to the purity of this lactose is substantiated. It is supplied in 1 lb. sealed tins, price 3*s*. 6*d*. each.

THE Nouvelle Société Helvétique, 28 Red Lion Square, London, W.C.1, has just issued a useful bibliography of books dealing with Switzerland which have appeared in English since 1880. The list includes not only guide-books and tourist literature but also those on historical, constitutional, and social subjects, and in addition works by Swiss writers translated into English, as well as books in English on such pioneers as Rousseau and Pestalozzi in education and de Saussure in science. All lovers of Switzerland and its people will find the bibliography helpful and interesting. Copies may be obtained upon application to Dr. Paul Lang, Secretary of the Society, at the above address.

THE names of the green pheasant, the copper pheasant, and the golden pheasant were added to the Schedule to the Importation of Plumage (Prohibition) Act, 1921, by virtue of the Importation of Plumage (No. 2) Order, 1922, dated June 12, 1922. As was announced in the Press at the time, the Advisory Committee appointed under the Act, in recommending the addition of the names of these birds to the Schedule, further recommended that the matter should be referred to them again for review after the expiration of twelve months. The Committee has now reconsidered this question and has recommended that the golden pheasant should be included in the Schedule for a further period of twelve months, but that the copper and green pheasants should be removed from the Schedule at the end of the present year.

The Board of Trade accordingly desires it to be known that an order will be made in due course, removing the names of the copper and green pheasants from the Schedule, with effect from January 1, 1924.

Science announces that the committee of the Daniel Giraud Elliot Medal desires to receive nominations for the awards of the years 1921 and 1922, which are still open, because the committee has not been able to reach unanimous conclusion on any work thus far brought to its attention. The Elliot Medal is awarded for some especially great contribution, not for general accomplishment, in the field of either zoology or palæontology. It is not restricted in either branch to the vertebrates, but may be made in either the vertebrate or invertebrate field and is open to scientific workers of the world. The award of the gold medal is accompanied by a generous honorarium. Nominations for the two years mentioned, namely, 1921 and 1922, and also for 1923, can now be received. Communications should be addressed to the Secretary of the National Academy of Snccices, Washington, D.C.

THE eleventh meeting of the Indian Science Congress will be held at Bangalore on January 14-19, 1924. H.H. the Maharajah of Mysore will be patron of the meeting, and Sir Asutosh Mookerjee will be president. The following sectional presidents have been appointed :—Mr. B. C. Burt (agriculture) ; Prof. C. V. Raman (physics and mathematics) ; Dr. E. R. Watson (chemistry) ; Prof. K. N. Bahl (zoology) ; Prof. Agharkar (botany) ; Mr. H. Bosworth Smith (geology) ; Lieut.-Col. Christophers (medical research) ; Mr. J. Hornell (anthropology). The honorary local secretaries will be Prof. F. L. Usher, Central College, Bangalore, and Mr. S. G. Sastry, Secretary, Board of Scientific Advice, Bangalore. Further information can be obtained on application to the hon. general secretary, Dr. J. L. Simonsen, Forest Research Institute and College, Dehra Dun, U.P. India.

THE Journal of the Röntgen Society (the oldest radiological society in the world) for July (vol. xix. No. 76) contains an account of the twenty-fifth anniversary dinner of the Society held in March last, and a translation of Röntgen's first and second memoirs on X-rays, entitled "Concerning a New Kind of Ray," which are interesting reading.

THE latest catalogue (No. 378) of Messrs. Bernard Quaritch, Ltd., 11 Grafton Street, W.1, is of a miscellaneous character, but of the 1399 second-hand works offered for sale many deal with science, and, as is usual with the lists issued by this firm, some are very scarce and choice. The catalogue also comprises a list of selected new and recent publications.

THE McGraw-Hill Publishing Co., Ltd., announces an interesting new series of books under the title of "Concise Studies in Economic Problems," which will embody the results of research studies made by the Institute of Economics of Washington, D.C., U.S.A. The first volume will be "Germany's Capacity to Pay." Succeeding works will deal with International Economic Reconstruction, International Commercial Policies, Industry and Labour, and Agricultural Economics.

Our Astronomical Column.

THE DENSITY OF THE CORONA.—The question of the density of the corona is of interest both with regard to possible refraction of starlight in the investigation of the Einstein light-deviation, and with regard to the amount of resistance met with by comets of small perihelion distance. *Astr. Nach.*, 5238, contains a discussion of the subject by B. Fessenkoff, of Moscow.

The author assumes that the total light of the corona is equal to that of the full moon, and that the light intensity varies (1) as the inverse square, (2) as the inverse fourth power, of the distance from the sun's surface. He utilises some studies of his own on the light-reflecting powers of the terrestrial atmosphere at various heights, obtained from measures of the brightness of twilight for different angles of depression of the sun. He calculates that the light given by a small volume of the corona, 5′ from the sun's limb, in terms of the light given by an equal volume of terrestrial atmosphere, of the density and composition that exist at a height of 100 km., placed in the same situation as the coronal volume, is :—on supposition (1) $0{\cdot}52 \times 10^{-3}$; on supposition (2) $0{\cdot}27 \times 10^{-4}$. The density of the corona at 5′ from the limb is that of hydrogen at pressures $0{\cdot}43 \times 10^{-5}$ mm. and $0{\cdot}22 \times 10^{-6}$ mm. (temperature 0° C.) on the two suppositions. It will be remembered that the nearest stars that have been observed in the Einstein investigation were considerably further from the limb.

REPORT ON THE KAPTEYN SELECTED AREAS.—Prof. Van Rhijn, of Groningen, has issued a useful report on the progress of researches on these areas. They are distributed on a uniform plan over the celestial sphere, and are to be studied in an exhaustive manner by a number of co-operating observatories. The first step is the formation of a photographic Durchmusterung of the stars in the areas ; this is being done at Harvard and Arequipa, with apertures of 16 and 24 inches, and limiting magnitudes 15·9 and 16·3 respectively ; these plates are being measured at Groningen. It is estimated that the number of stars is about a quarter of a million, the total area being 225 square degrees, or 1/183 of the sphere. The positions are determined to an accuracy of half a second, the magnitudes to 0·1 mag. The centennial proper motions of the stars of mag. 12 and brighter are determinable to a third of a second with the aid of the *Carte de Ciel* plates ; those of the fainter stars will not be obtainable for some years with the necessary accuracy.

The best methods of determining absolute motions and eliminating magnitude error are discussed ; the author hopes that Kapteyn's plan for a photographic parallax Durchmusterung will not be abandoned. He admits that the results are illusory for particular stars, but he thinks that they will serve to compare the parallaxes of stars of the same magnitude with large and small proper motions. The colour-indices are being determined by Seares by comparison of photographs on ordinary and orthochromatic plates. Altogether the report gives a hopeful summary of the results already attained and those to be looked for in the near future.