

where great magnifications were desired. This last difficulty might to some extent be surmounted by using as a secondary instrument the two strips of a bolometer, so that fluctuations would make proportional changes in both strips, whereas a deflection gives a differential effect. Experiments, however, on the application of the principle are in progress.

G. A. SHAKESPEAR.

The University, Birmingham, June 24.

Wireless Antennæ.

IN recent issues of NATURE several correspondents, in referring to the fact that a metal bedstead or a few wires stretched a few feet above the ground will make a wireless antenna, have overlooked a most important point, viz. that with such an antenna the ordinary methods of tuning are quite useless.

A piece of wire netting suspended a few feet above the ground makes a most effective aerial, and enables one to receive loud signals from long-distance stations, but signals from Eiffel Tower, C'eehorpes, &c., will all be mixed up, and the ordinary tuner will not separate them effectively. It seems to me that this proves that the usual theory of the waves travelling through space in the air above the earth's surface and being cut by the aerial does not *wholly* account for the facts.

Wireless signals that are feeble when the surface of the earth is dry, becoming much stronger after rain, and the well-known fact that these waves travel much better over sea than over land, all seem to indicate that the aerial waves are *at least* supplemented by waves that travel along the surface of the earth, and that the wire netting, bedsteads, &c., act as counter capacities, allowing these waves to flow from the earth through the receiver. The capacity of a small piece of wire netting near the ground is much greater than a very extensive aerial high up.

Canterbury.

A. LANDER.

The Occurrence of "*Anomalocera pattersoni*," Temp., in Mounts Bay.

It is stated by Mr. L. H. Gough ("Report of the Plankton of the English Channel," 1903), that the copepod *Anomalocera pattersoni*, R. Temp., may generally be regarded as an oceanic species. Gough's observations tended to show that Gran was correct in assuming this to be the case, although Cleve considered the species to be neritic. Sars, in his "Crustacea of Norway," speaks of the occurrence of this copepod "off the south and west coasts of Norway, generally congregated in great shoals," but throughout the reports published in connection with the international fishery investigations, no record occurs of its similar abundant occurrence in the English Channel.

It is interesting to record, therefore, that during an intensive survey of the planktological conditions of Mounts Bay, performed from the s.y. *Mera* on June 2, an extensive shoal of the species was met with at the surface on a position $50^{\circ} 4' 20''$ N. \times $5^{\circ} 27' 55''$ W. The product of a five minutes' haul with the coarse tow-net amounted to 34.75 c.c. of material, of which at least three-fourths was made up of *Anomalocera*, both in its adult and developmental stages. The visitation of this copepod, in association with several other oceanic forms of phyto- and zooplankton, to a comparatively close inshore position may possibly serve as an indication of somewhat abnormal hydrographical conditions, but unfortunately no physical observations are yet to hand to enable a comparison to be formed.

HAROLD SWITHINBANK.

S.y. *Mera*, R.Y.S.

G. E. BULLEN.

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Artificial Hiss.

LORD RAYLEIGH'S "sound more like an *f* than an *s*" (NATURE, May 29, p. 319) is due, according to Köhler's observations (*Zeits. f. Psych.*, 64, p. 93), to a slightly too high pitch. A Galton whistle, set for a tone of 8400 v.d., will give a pure *s*.

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THE BICENTENARY OF THE BOTANIC GARDEN OF ST. PETERSBURG.

THE bicentenary of the foundation of the Imperial Botanic Garden at St. Petersburg was celebrated with unusual pomp on June 24. The history of the garden, its share in the botanical exploration of north, central, and east Asia, and the practical completion of its reorganisation on modern and truly liberal lines justified the festive character of the proceedings. They were initiated on the eve of the jubilee by a special service, attended by the staff of the garden, in the Peter-Paul's Cathedral, and the laying down of a wreath of roses at the tomb of Peter the Great, the founder of the garden, and on the following morning by a little shower of honours for the director and his staff.

The principal ceremony took place in the afternoon in a building attached to the old herbarium, in the presence of a brilliant gathering, including the Princes Peter and Alexander of Oldenburg, Prince Gagarin, representing Princess Eugenia of Oldenburg, under whose patronage the garden is placed, the Ministers of Agriculture, Commerce, Justice, Public Cults, and Marine, and other prominent officials, and a large number of delegates from the Russian academies, universities, botanic gardens, and kindred institutions, and from foreign countries. The solemn meeting was preceded by a Te Deum, and formally opened by the Minister of Agriculture, Mr. Kriwoshein. A rescript from the Emperor was read, in which it was announced that the garden would henceforth be known as the Imperial Botanic Garden of Peter the Great. Then followed an eloquent address by the director of the garden, Prof. A. Fischer von Waldheim, in which he traced the history of the garden and its present organisation and object; the reception of the delegates, and the presentation of medals and souvenirs commemorating the jubilee.

The next day was reserved for the inspection of the garden, museum, and laboratories, and in the afternoon a visit to Peterhof, where the guests experienced an exceptionally cordial reception. In the evening the festivities came to a conclusion with a gala performance in the opera house in the Narodni Dom.

Most of the botanical gardens and many of the other botanical institutions sent their congratulations, whilst Bulgaria, Denmark, England (Kew and Chelsea), Germany, and Sweden were represented by delegates.

The garden was founded by Peter the Great about 1713, so that it is practically as old as the

capital itself. The site selected for it was on one of the islands in the Neva, low-lying, boggy land, and the object the cultivation of medicinal plants mainly for the army and navy. Hence it was called the Apothecaries' Garden, and the island itself Apothecaries' Island. Among those attached to it were Siegesbeck and Falk, well known from their connection with Linnaeus. In 1823, however, the garden was put on an entirely new footing by Alexander I., who raised it to the rank of a scientific institution under the title Imperial Botanic Garden. His first director was F. E. L. Fischer (1823-1850), who had already risen into notice through his successful management of the famous garden at Gorenki, near Moscow. Thanks to his wide connections with botanists and botanical gardens outside of Russia—he was *inter alia* a personal friend and life-long correspondent of William Hooker—and his active encouragement of botanical research in the Russian Empire, he was able in a short time to build up a very large collection of living and dried plants.

After Fischer's retirement in 1850 the history of the garden was of a somewhat varied character. From 1830 to 1863 it was under the ministry of the Imperial Court, and there was at times a danger of its becoming reduced to a nursery for table decorations for the Court; but when, in 1863, it was transferred to the Ministry of Agriculture it was definitely saved from that fate, and it soon regained, and, in fact, eventually exceeded, its old reputation under the double directorship of Trautvetter and Eduard Regel, and afterwards under Regel's undivided control. If Regel, by training and taste, inclined more towards horticulture and a lighter conception of the aims of phytography, his collaborator and colleague, the scholarly *botanicus primarius* and academician C. Maximowicz, excelled through the rare thoroughness and comprehensiveness of his taxonomic work. Both were fertile writers, and the exploration of Turkestan, Siberia, and Central Asia, which in those days proceeded with such marvellous energy, found in them most able interpreters. Maximowicz died in 1890, and Regel followed him soon.

After the short directorship of Batalin, the present director, A. Fischer von Waldheim, until then professor of botany in the University of Warsaw, was appointed in 1897. With him a new era began. It has so far resulted in the comprehensive reorganisation of the establishment and its transformation into a great national institution for the study of pure and applied botany, comparable to the institutes of Kew and Dahlem, although less universal in its range in so far as it is expected to serve in the first place the special interests of the Russian Empire. To quote from the official French guide, published on the occasion of the jubilee, the Imperial Botanic Garden of Peter the Great is intended for the study of the plants which form the flora of Russia and the adjoining parts of Asia, of economic botany, plant anatomy and physiology, of plant parasites and the means to

fight them, for seed control, and the cultivation and testing of plants of practical importance for agriculture, horticulture, industries, and medicine, and finally for the popularisation of the botanical sciences.

The garden covers an area of fifty acres, of which thirty go to form what is called the "Park," or garden proper, whilst 7.5 acres are under glass and more than twelve are occupied by buildings. The scientific staff consists of the director, three chief botanists, one chief conservator, five conservators, two assistant conservators, and one librarian. For purely administrative purposes the director has at his disposal a secretary, a cashier, an "intendant," a clerk, and two assistant clerks, these officials forming the "chancery," or director's office. The garden work is superintended by two head gardeners, with two assistants and thirty-five gardeners. There are about fifty "fixed" labourers of both sexes, and about as many artisans, guards, porters, and inferior hands. The Botanic Garden comprises, beside the "Park" and the glasshouses, the following distinct departments:—the herbarium, the museum, the library, the zoological laboratory, the seed control station, the phytopathological station, the "seminarium," or depôt for seeds, gathered in the garden or sent in by travellers and explorers, or received in exchange or by purchase, the "chancery," and the school for gardening.

A splendid new building for the herbarium and library has just been completed, whilst another for the museum collections, and on a similarly large scale, is to be commenced next year. The garden has also its own electric station and electric engineer. It is not possible here to enter into any details concerning those departments, but it may be mentioned that the herbarium and the library, both of which are among the richest in the world, will no doubt remain for long the most valuable portion of the establishment and the centre of its activity. The herbarium is the recipient of the collections of the numerous expeditions organised by the Colonisation Commission (since 1908), and devoted to a grandly planned botanical survey of the Asiatic possessions of the empire. As a similar survey is in course for Russia proper, a collection is building up probably quite unique in its completeness and representative character. A considerable addition to the staff is contemplated, and concurrently an increase of the budget of the garden to 160,000-170,000 roubles (16,000l.-17,000l.).

This brief account would be incomplete without a word of admiration for the liberal and far-seeing spirit in which the jubilee was conceived, and the whole-hearted sympathies with which everyone, from the representatives of the Imperial Family and the Government down to the last delegate, joined in the recognition of the national importance of the work done by the establishment, and still more of the work which is to go forth from it in the future. There was not much boasting, but a joyful expectation of new and greater achievements.

O. S.