

frequency of the aurora at London. In the case of auroræ observed in Edinburgh, north-east Scotland and in different regions in Scandinavia, the months in which the greatest frequency is recorded are September and October (perhaps more generally October) and March and April (perhaps more generally March).

The accompanying figure (Fig. 1) shows in a graphical form the annual variation of these magnetic and auroral frequencies, indicating their epochs of maxima and minima. Above them are the curves showing (at the top) the epochs when the earth's poles are turned towards the sun (the origin of our seasonal changes) and (below) when the sun's poles are turned towards the earth.

The coincidence in time between the epochs of the maxima of the frequency of magnetic disturbances

the less disturbed solar polar regions were in action should be somewhat *reduced*.

It was shown in the paper that this is actually the case, the frequency of the magnetic disturbances at the equinoxes being in greater excess over the solstitial frequency the greater the degree of disturbance.

There is thus reason to believe that the orientation of the solar poles with regard to the earth is the origin of these magnetic and electric annual changes.

WILLIAM J. S. LOCKYER.

THE ORNITHOLOGIST IN LAPLAND.¹

RUSSIAN Lapland, although it has its charms during the brief summer, cannot be described as a desirable country, either for residents or tourists, since, except in a few sheltered spots, it produces little



FIG. 1.—Driftwood on Beach, Kanin. From Pearson's "Three Summers among the Birds of Russian Lapland."

and auroræ, and those of the greatest inclination towards the earth of the north and south solar polar regions can thus be seen at a glance.

The inquiry was pursued further to find out whether this yearly inequality of these terrestrial magnetic disturbances was influenced differently according as the sun's polar regions were, for several groups of years, in an undisturbed or disturbed condition.

It was expected that the oscillation of more disturbed solar polar regions towards and away from the earth would tend to *increase the difference* between the frequency of magnetic disturbance at the equinoxes and solstices, while this difference for those years when

fodder save reindeer moss, while the fishing and shooting are but indifferent, and in late seasons the ground may remain covered with snow until well into June. Moreover, almost as soon as summer has set in, mosquitoes of a particularly vicious kind make their appearance in swarms, and render life well-nigh intolerable in the marshy districts which form the greater part of the country. When to these drawbacks are added the difficulties of travel, both by sea and land, there is little wonder that northern Lapland attracts

¹ "Three Summers among the Birds of Russian Lapland." By H. J. Pearson. Pp. xvi+216; illustrated. (London: R. H. Porter, 1904. Price 21s. net.)

but few tourists. Nevertheless, to the ornithologist and the egg-collector it is little short of a paradise, birds of many kinds resorting to its inhospitable shores for the breeding season in vast numbers. The variety and abundance of bird-life are, indeed, testified by the statement of the author of the handsome and exquisitely illustrated volume before us, that during his first trip he encountered no less than seventy-six species, of forty-four of which he succeeded in obtaining the eggs. This exuberance of bird life the natives do their best to keep in check, and it must be confessed that a bird protection society would find plenty of scope in the country, as all birds large enough to be eaten are shot during the breeding season, while the eggs of many species are taken by the thousand. An excuse for these practices is to be found, as the author states, in the circumstance that birds only visit this part of Lapland in order to breed, and if they did not do so then, the natives would never have a chance of killing them at all. Loons, or divers, it appears, are often taken accidentally in fishing nets, but puffins, which swarm in the country and have been described in an official publication as "ducks," are taken for food by stretching old nets across their holes.

Previous to the first of the three trips recorded in this volume, Mr. Pearson had already visited Lapland, and has described his experiences in "Beyond Petsora Eastward." Of the three trips described in the present work, the first was undertaken in 1899, and was devoted to the exploration of the northern districts of the country; in 1901 the author visited the Kanin Peninsula, while in 1903 he penetrated the interior of the country south of Kola. The year 1899 was remarkable for the late melting of the snow, which still covered the country on June 2, when the herring-gull was found nesting on little patches of clear ground in the snow. During this year the starling seems to have first extended its range into the country, the species being at that time quite unknown to the natives. Among the larger birds, white-tailed eagles were found to be not uncommon, although, owing to the rewards offered by Government for their eggs and young, they can only build in safety on inaccessible crags. Ospreys were, however, sought in vain, these birds being persecuted by the Finns on account of the fish they destroy. An immense eagle's nest in one of the few trees remaining on the Murman coast was one of the "finds" of this trip. Very notable, also, was the discovery of a nest of the rough-legged buzzard on the ground. Among the prizes in the way of eggs may be mentioned those of the little stint and the dotterel, while those of the turnstone, although by no means uncommon, were exceedingly difficult to discover. A breeding colony of glaucous gulls yielded quite a harvest of eggs. Apparently the earliest breeder is the Siberian jay, which nests in April, when the country is inaccessible, except on ski. During his trip the author was fortunate enough to come across an old Finn who collected with John Wolley forty years ago on the Gulf of Bothnia.

The accompanying picture is an example of the illustrations which render this interesting and well written volume so attractive.

R. L.

PROF. CHARLES SORET.

CHARLES SORET, honorary professor of physics at the University of Geneva, whose recent death we regret to announce, was born at Geneva on September 23, 1854. After a general course of study at the college and at the university of his native town, he devoted himself especially to the study of physics.

In this he followed a family tradition, his father being the Genevese physicist Jacques-Louis Soret. Like his father, from whom he inherited his deep love and respect for scientific truth and his scrupulously exact method of working, he will be remembered as one of the most distinguished representatives of the science of Geneva. During many years, until the death of Louis Soret in 1890, he was his father's colleague and collaborator.

Charles Soret took successively at Paris the degrees of licentiate in physical science in 1876 and of licentiate in mathematical science in 1878. After a visit to Germany he returned in 1879 to the University of Geneva to fill the chair of mineralogy, a subject which, by the enthusiasm of his teaching, he rendered widely popular. His earliest works date from this period; they are published in the *Archives des Sciences physiques et naturelles* of Geneva, a journal with which he was associated during more than twenty years, and to the publication committee of which he rendered many signal services. Little noticed at first, the works of Soret opened out the way for other investigators; at the present day every mineralogist is acquainted with "Soret's Law" and "Soret's refractometer." Crystallography was the science especially cultivated by Soret; the subject-matter of his course was published by him in 1893, under the title of "Éléments de Cristallographie physique," a work well known and appreciated by specialists.

On Wartmann's death in 1886, Soret was called to the chair of experimental physics in the University of Geneva, and during two years he was burdened with a double duty. By transferring the mineralogy course to one of his students, he was enabled to continue his own peculiar studies, especially in the domain of crystallographic optics, for which he showed a marked preference. He was an excellent professor of physics and gave a new impulse to the study of that science at Geneva; the laboratory was largely extended, and many serious students came to group themselves around a master so conscientious as to devote himself almost exclusively to their scientific training. Soret would certainly have published more had he not given himself with so single a mind to the exacting and fatiguing duties of directing his laboratory.

A valued member of the faculty of science, he was at the same time appreciated by the whole university. After serving during a long period as secretary of the university senate, he was, in 1898, appointed to the honourable but exacting office of rector of the university. Owing to his serious qualities, to his firm but conciliatory character, he wielded great authority, and his duties as rector were filled with rare distinction. Applying scientific method in all things, he was a remarkable administrator, and many are the services he rendered to the university. But he overtaxed his powers, and when his rectorate expired, in 1900, he was forced to resign his professorship, a step which caused profound regret among his colleagues and friends.

After a rest of two years his health seemed re-established. He resumed his scientific activity and his researches in the laboratory that he had created. He had just published in the *Archives* for March, 1904,¹ a new investigation of the refraction of tourmaline when, on April 4, he was removed from his family and friends by a sudden illness.

The death of Soret is a great loss to his country and to science in general. Much might still have been anticipated from a mind so lucid, so methodical,

¹ The completion of this work is published in the May number of the *Archives*.