

for their own sake, but also for the progress of the study of plant communities, which is greatly hampered by the lack of information respecting the life-histories and biotic relations of their constituent species. Further, until such data are available, it is useless to attempt to unravel the complex tangle of factors involved in the phenomenon of competition.

Much relevant information is scattered through the literature but is comparatively inaccessible; much, too, is known to field naturalists, but perishes with them. The collection of the published data, and such original observations as are available, will not only be valuable in itself, but will also provide the surest means of bringing to the notice of students the many lacunæ that require to be filled.

The council of the British Ecological Society has had the matter under consideration, and at the annual meeting on Jan. 7, the Society decided to undertake the publication of a British biological flora which should embody the available data regarding the biology and ecology of the native and naturalised British species.

The writer, who has been making observations and collecting data of this character with reference to British woodland species for several years past, has undertaken the preparation and editing of the work, but it is manifestly a task that can only be successfully accomplished by the active co-operation of botanists, professional and amateur alike, throughout the country.

A schedule indicating the scope of the projected work has been prepared by the writer and will be sent to anyone willing to assist.

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#### Polarisation of Radio Waves.

In some recent work on this subject carried out for the Radio Research Board, the following interesting results have been obtained in connexion with the propagation of long waves (14,350 metres).

In the course of simultaneous observations over a period from one hour before until one hour after sunrise of the same transmission from St. Assise by two stations, Slough and Aberdeen, roughly 400 and 1000 km. from it and approximately on the same great circle, it has been found that in the period preceding sunrise the wave arriving at the nearer station is plane polarised, with its plane of polarisation rotated in a clockwise direction when looking in the direction of propagation, whereas at the more distant station the rotation is anti-clockwise. By the time of sunrise both these abnormal polarisations have gradually decreased and disappeared, and in some cases at the nearer station the space wave appears to have entirely vanished also. About half an hour later, however, the space wave reappears at the nearer station, but this time with left-handed polarisation.

This persists with varying intensity throughout the day, again disappearing about 15.00 G.M.T., when the right-handed polarisation returns for the night.

It has also been shown that the wave reaching the far station has started from the transmitter at practically the same angle of elevation as the wave to the near station, and that its downcoming angle at the far station is comparatively steep. Internal evidence is strongly against the idea of a twice-reflected wave, mainly because the variations of direction and intensity observed are too great to fit in with the roughly known values of the reflecting power of the layer for a single reflection; and there seems a strong probability that we are here dealing with some form

of doubly refracted ray of which one element is being received at each station. The direction of transmission makes an angle of  $15^\circ$  with the magnetic meridian, but owing to the high value of the magnetic dip in these latitudes it is difficult to link up these results with the theoretical formulæ. Further experiments on the subject are in progress.

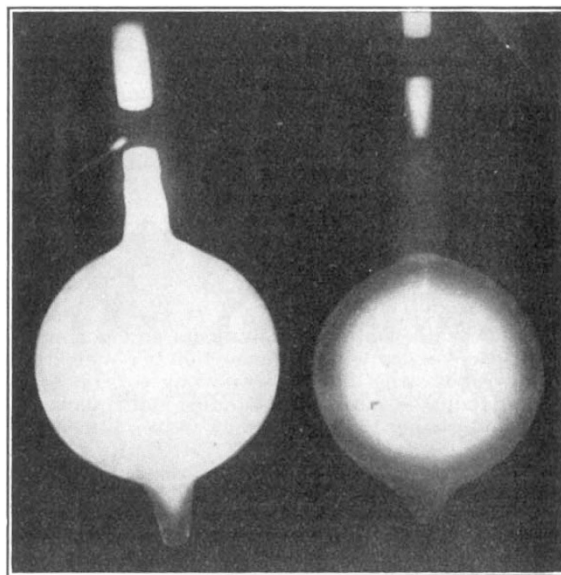
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#### A New Form of the High Frequency Electric Discharge.

RECENTLY, we have conducted experiments on the electric discharge through gases at very low pressures with alternating potentials of about  $4 \times 10^7$  cycles per sec. (7 metre wave). Results were obtained with mercury at pressures of the order of  $10^{-3}$  mm. in a bulb 20 cm. diameter with neck of 2 cm. diameter, and external copper-foil wrappings as electrodes on the neck, and showed that the discharge could take two distinct forms as shown in the accompanying photographs.

In the first type of discharge (Fig. 1, A) the discharge



A

B

FIG. 1.

was projected as a visible streamer into the bulb below, which was almost completely filled with the glow. In the second case, with lower exciting power, the discharge (Fig. 1, B) took the form of a spherical glow of uniform luminosity separated from the walls by a dark space. A considerable portion of the neck of the bulb was completely dark, and discharges of the ball type could be maintained with no luminous effects at all in the side tube.

The behaviour of the two types of discharge when subjected to magnetic fields, showed quite diverse effects, and after many experiments with different gases, it was concluded that the bulb discharge was maintained (once initiated) by the stray alternating electric field from the electrodes which is projected down the neck into the bulb.

This new type of electric discharge is analogous