sensibility of the olfactory mucosa should be abolished by painting with a 20 per cent. cocaine solution; and then see if a bird such as a gull can balance and soar as well after painting as before. Plugging of the nostrils, or section of the nerves, can also be tried. The effect to look for is on the capacity for soaring and gliding flight, not of flapping flight.

W. E. M'KECHNIE.

17 Chepstow Place, London, W.2,
December 15.

Nature Study and Phenology.

PHENOLOGY is the name given to that branch of meteorological science which has as its object the studied effect of weather conditions upon the seasonal development of animal and plant life.

From the late seventies of last century, and since 1891 on a uniform systematic plan, the Royal Meteorological Society has issued an annual report on phenology. This report, by collating and co-ordinating the work of a number of observers—mostly amateurs—in the British Isles, is able to present in summary form, supplemented by tables and maps, information of a most valuable botanical, ornithological, and agricultural nature.

Nevertheless, to accomplish such results, all that its observers are required to do is to note carefully the first appearance of certain birds and insects, twelve in number, and the first blooming of fourteen common plants. Other migrants and notes are asked for, but these are of secondary importance.

Here is a work which should surely appeal to the Nature-lover. By simply recording a few observations on a prescribed form, and forwarding the same promptly about November 15 (the close of the phenological year) to the Royal Meteorological Society, 49 Cromwell Road, S.W.7, the work of the amateur is lifted from a purely local value to become a real link in the progress of scientific research.

Stations are still urgently needed in many parts of our islands, and a copy of our observing form will be forwarded upon application to the office of the Society, or to one of us.

J. E. CLARK,
41 Downscourt Road, Purley, Surrey.
I. D. MARGARY,
Chartham Park, East Grinstead, Sussex.

Water Snails and Liver Flukes.

IN connexion with the letter on the above subject in NATURE of November 25, p. 701, I should like to ask Dr. Monica Taylor if she has actual proof of sheep coming into contact with *Limnæa peregra*? The habitat of this species is so much more "watery" than that normally chosen by *L. truncatula* that it seems very doubtful if sheep could eat it with their food. Again, *L. truncatula* is such a widely distributed species that it seems difficult to believe that it is either rare in or absent from any district in which damp sedgy pastures are to be met with.

Planks left undisturbed for a few weeks, or cut rushes shaken over a newspaper after having lain on the ground for a time, might reveal the presence of *L. truncatula* in many places from which it was apparently absent. And what of *L. palustris*, the habits of which are often nearer to those of *L. truncatula* than *L. peregra*?

A. W. STELFOX.

National Museum, Dublin,
December 12.

REFERENCE to "The Life-History of the Liver Fluke," by A. P. Thomas (Q.J.M.S., 23, 1883), or indeed to almost any text-book in zoology, will show Mr. Stelfox that in order to become infected it is not necessary for sheep to eat the intermediate snail host of *Fasciola hepatica*. It suffices that the encysted cercariæ be swallowed. The latter may be found at considerable distances from their snail host, for the tailed cercariæ which give rise to the encysted forms exist as such for about a week after they have escaped from the host and are extremely active. On account of their microscopic character (they are just visible to the naked eye as snowy specks) the merest trace of water suffices for their needs. The more "watery" habitat of *L. peregra*, which is extremely common in all sorts of ditches, puddles, and streams, constitutes no impediment, therefore, to this snail acting as a disseminator of the liver-rot parasite granted that it can become properly infected. That it is capable of being infected and of setting free perfectly developed cercariæ I have abundant evidence.

In answer to my request for literature references to any host other than *L. truncatula* of the liver-rot parasite, Dr. Paul Pelseneer has kindly given me several, one of which (Lutz, *Centralbl. f. Bakteriol. und Parasitenk.*, xi. pp. 781-796, 1892), since it refers to *L. peregra* as an intermediate host of *Fasciola hepatica*, may be of use to Mr. Stelfox. With regard to the first of the methods of discovering *L. truncatula* suggested by Mr. Stelfox, I have had negative results in some districts although the sheep in these same districts are infected.

MONICA TAYLOR.

Notre Dame, Dowanhill, Glasgow,
December 16.

Effect of Moonlight on the Germination of Seeds.

DURING the summer of 1921 I investigated the effect of moonlight on the germination of seeds, and the results seemed to indicate a greatly increased velocity of germination. In order to determine whether this might be due to the effect of the moonlight on the diastase, a small quantity of mustard seed was crushed, and weighed quantities, after mixing with known amounts of water, were exposed to moonlight in Petrie dishes, controls set alongside being covered. Estimation with Fehling's solution of the sugar produced showed that there was an increased yield of about 15 per cent. caused by the moonlight.

A possible explanation of these results is to be found in the fact that at certain periods moonlight is plane-polarised, and in order to test this suggestion the experiments with crushed mustard seed were repeated with daylight after polarisation, either by reflection or by a Nicol prism. Control experiments were also carried out both in darkness and in ordinary daylight. The temperature was the same for all three experiments in each case and lay between 10° and 18°. A remarkable increase in the amount of hydrolysis was always noted when polarised light was used. Similar results were obtained with fresh oats, wheat, and cornflour, to which diastase had been added.

The investigation of this phenomenon is now being continued at Liverpool in conjunction with Prof. E. C. C. Baly and Prof. J. McLean Thompson, and the results already obtained are worthy of record since they give strong support. Diastase is added to a suspension of freshly prepared starch and the mixture well shaken. A drop of the mixture is placed on three slides under microscopes, one