with so little satisfaction to the already burdened agriculturist, can hardly fail to prove of interest to the zoological student of farm pests.

ALLEN HARKER.

Royal Agricultural College, Cirencester, April 10.

RAIN CLOUDS ON LAKE TITICACA.

THE cloud system here, 12,500 feet above sea-level, is so beautiful, and seems to throw so much light on the formation of one particular type of shower, that I venture to send diagrammatic sketches of two excellent specimens of cloud-building over rain.

I have never seen cumuloform clouds so perfectly developed as on this lake. Whether the height above the dust and haze of lower levels makes the blue sky darker than usual, or whether the temperature is such that the cumulus is composed of snow-flakes instead of water-drops, the contrast between the sky and cloud is much greater than usual.

The sketches were taken on a showery day, and the clouds were visible simultaneously in different directions. The type of shower is not unknown at home, but there much complication arises from the almost constant existence of cyclonic cloud systems.

Certain features are common to both pictures. Nearest the earth, appears a more or less conical-shaped space *r*,

FIG. 1.—*b*, blue sky; *c*, flat-topped mass of dark cloud, rounded components; *r*, rain; *w*, white cloud, tending to flatten out and to cirrify.

FIG. 2.—*b*, blue sky; *c*, dark cumuloform cloud, flat-topped at edges; *d*, dark belt; *r*, rain; *w*, white cloud, tending to flatten and to cirrify.

of uniform inky blackness, where rain is falling. Above, and stretching laterally some distance beyond the rain, is a belt of dark cloud, *c*, curiously flattened at the top; but the outlines are always *rounded*, and there is no trace of linear or hairy structure. In Fig. 2 a mountainous rocky cumulus rises above the flat dark mass *c*; and as the rain could be seen falling, I have indicated that appearance in the sketch.

In both, a white cloud, *w*, of remarkable shape and structure, rises above the dark mass *c*. Sometimes, as in Fig. 1, this cloud is nearly uniform in structure, but exhibits a tendency towards hairy structure at the edges. Other times, as in Fig. 2, the white cloud *w* shows traces of

cumuloform structure of a very peculiar type. Instead of round, rocky lumps, the white cloud is composed of long, straight, fingery masses of cumulus, with a tendency to fibrous or hairy structure, and radiating slightly outwards from the base, like the head of a cauliflower. I have endeavoured to suggest this appearance by the straight lines, drawn through *w*, in Fig. 2; for the real structure defies delineation with pen or pencil.

In all cases, the top of *w* is more or less flat, and the whole diffuses outwards, sideways, or edgeways, rather than upwards. As the shower breaks up, *w* seems to be left as a middle-level layer of strato-cirrus.

The whole shower is surrounded by blue sky, there is

no cirrus at a higher level; and while the low cloud *c* moves from north-east, the white cloud *w* may be coming either from north-east or more probably from north-west.

The puzzling nature of cloud perspective makes it very difficult to interpret the appearance of these clouds. There can be little doubt that the lower clouds, *c*, are the product of the condensation of rising columns of air; but while the somewhat cumuloform structure of *w* ought also to indicate an upward motion, the flat top, and outward diffusion, would suggest a more horizontal motion. I cannot therefore suggest any rational explanation of the building of these shower clouds; and the true nature of this phenomenon will only be discovered when the theodolite is used to determine whether *w* lies vertically or horizontally in the blue sky.

RALPH ABERCROMBY.

Lake Titicaca, February 28.

A FLAT FISH NURSERY.

PROF. EWART submitted the following report at a recent meeting of the Scotch Fishery Board:—

"I have to report that I recently discovered in the in-shore waters what might best be described as a flat fish nursery. This nursery, which is about five miles in length, and from two to four miles in width, stretches along an exposed and only slightly indented shore, where the sea rises during spring tides from sixteen to twenty feet. The bottom of this area consists chiefly of fine sand, covered here and there with large patches of the common sea-mat (*Flustra*); the average depth is about four fathoms. When a small beam-trawl (with a net having meshes small enough to capture all the fish over two inches in length) was carried over the bottom parallel to and at a distance of about half a mile from the shore, large numbers of small flat fish were invariably secured. On one occasion as many as five hundred and sixty of these small fish were taken in less than an hour, and at all times the 'take' was large, and usually from 80 to 85 per cent. of the small flat fish were under two and a half inches in length. Some distance from the shore the takes were smaller, and on one occasion the trawl only secured twenty-three small fish, when used in about ten fathoms of water, some seven miles from shore. Along with the small flat fish, there were usually a few small round fish, a number of shrimps—sometimes over, sometimes considerably under one pint—numerous hermit and other crabs, and large quantities of *Flustra*. As it may be possible to materially increase the fish supply by affording protection to the young fish, I hope to be able ere long to report that other similar nurseries have been found, and also as to whether flat fish during their earlier stages of growth frequent the inshore in preference to the offshore waters.

"I have also to report that Mr. Scott (who in January last secured many thousands of plaice eggs floating in the open sea over a shoal of spawning plaice) has recently come across a large shoal of spawning haddocks which were apparently resting on the bottom at a depth of about 30 fathoms some fifteen miles off the coast of Banff. The surface waters over the shoal were crowded with haddock and cod eggs at nearly all stages of development. At a single sweep Mr. Scott with his tow-net secured nearly half a million eggs, while the trawlers were capturing hundreds of the spawning fish that were resting on or moving about near the bottom."

NOTES.

THE annual *conversazione* of the Royal Society will be held on Wednesday, May 8.

AT a meeting of the American Academy of Arts and Sciences on April 10, in Boston, the Rumford Medals were presented to Prof. Albert A. Michelson.

WE regret to have to record the death of Mr. R. Stirling Newall, F.R.S., at the age of seventy-seven. Mr. Newall's name was well known in connection with the invention and manufacture of wire rope and telegraphic cables. Just before his death he offered as a gift to the University of Cambridge the 25-inch refracting telescope which he had constructed some years ago.

THE Civil Service Estimates for the year ending March 31, 1890, show that a sum of £41,221 will be required for the maintenance of the Natural History Museum, South Kensington, for the present financial year. The corresponding sum in the Votes last year was £40,934. The principal increase is under the head of "Purchases and Acquisitions," for which the sum asked is £4700 instead of £3700. On the other hand, there is a decrease of £915 under the head of "Furniture and Fittings." The remaining heads do not show any material variation.

DR. LENDENFELD'S "Monograph of the Horny Sponges," which the Royal Society are about to publish, is now nearly through the press. It will consist of about 950 pages of text and over 50 plates.

WE have received the Report of the Mason Science College, Birmingham, for the year ended February 23, 1889. It is hardly creditable to Birmingham that the authorities of such an institution as this should still have to complain of a deficiency of income. Although the amount of the deficiency compares very favourably with those in former years, the Council feel that the economies they have been forced to adopt in order to decrease the difference between income and expenditure seriously impair the College work by hampering the Professors, especially those who have laboratories under their charge and require costly apparatus to illustrate their teaching.

PROF. H. G. SEELEY, to whom a sum was assigned from the Government Grant for a research on the Permian or Trias Reptilia, has been spending his Easter recess in St. Petersburg and Moscow. The officers and professors of the Academy, the University, and the School of Mines at St. Petersburg have shown him every attention, and his work in the museums appears likely to lead to important results.

MUCH excellent work has been done by the London Geological Field Class, which is carried on under the direction of Prof. H. G. Seeley. The Report relating to the excursions during the summer of 1888 shows that the work is conceived in a thoroughly scientific spirit, and that it cannot fail to exercise a most wholesome intellectual influence on all who take part in it. This year, on account of Prof. Seeley's projected visit to South Africa in July, the class will begin its labours earlier than usual. The first excursion will take place on May 4. Many persons interested in geology ought to take advantage of this opportunity for the study of the country around London, and we are glad to learn that the secretaries have received the names of more subscribers than they have received at the same date in any previous year.

MR. DUTHIE, the Government Botanist for Northern India, who has been at work with Dr. King, of the Howrah Botanical Gardens, in classifying the plants collected by him when attached to the Black Mountain Expedition, has now been directed by the Government to make a special study of the grasses and fodders of Upper India.

THE *Times of India* says that the Sukkur Bridge, which has been constructed over the Indus, has now been opened. At Sukkur the river is very rapid, but the large island of Bukkur, standing about midway in the stream, was of great assistance in carrying out the plans. There are thus two bridges, one from Bukkur to the left bank, the other from Bukkur to the right bank. The latter consists of three spans, the longest of which is 278 feet; the former, known as the Sukkur Bridge, is in length between the abutments no less than 790 feet. Two cantilevers,