Friday) the king and queen, decked with daffadowndillies, were led out to the Newton Moors, where they were solemnly interred in graves dug side by side in a sandy knowe. Hands were clasped through a hole bored in the sand between the graves.

The burial ceremony had disappeared by the time my mother went to school, but the selection of a king and queen still persisted, though in a degenerate form. The pupil who presented the largest sum of money to the teacher on Candlemas Day was crowned king or queen, and the royal health was drunk in toddy provided by the schoolmaster.

I append a list of some of the festivals in vogue in my mother's childhood. Some of them survived until within thirty years ago, but all, with the exception of New Year's Day, are now practically extinct.

Hogmanay (December 31).—Presents demanded.

New Year's Day.—First-footing; exchange of visits; carousal.

Hansel Monday (first Monday after January 1).—Exchange of presents.

Candlemas.—Election of school-king.

Huntygowk [Hunt the Gowk=Cuckoo] (April 1).—Fools' errands, &c.

May Day.—Washing of face in dew to keep freckles away.

St. John's Eve.—Firing of guns by sailors over captains' houses.

Midsummer Fair.—Great cattle-fair on main street of Newton. On this evening, or some other about this season, the herds in the neighbouring village commune of Prestwick built a great bonfire.

Kipper Fair (first Friday after August 13).—Procession of "whipmen" on gaily caparisoned horses. Horse races and gala on Newton Sands. Publication of lampoons. Feasting on kippered salmon and ale.

Hallowe'en (October 31).—The great saturnalia of the year. Stealing of kale-stocks; smashing of doors with same; smoking-out of house dwellers; disguises; turnip lanterns; diving for apples; eating from one common dish; burning nuts, and many other fortune-telling rites.

Martinmas.—Killing of the mairt or mart, the animal the carcase of which was salted down for winter use.

Christmas, Good Friday, and Easter were not observed.

I have not included hiring fairs, ordinary cattle and horse fairs, &c., or the fast days which were quite modern ecclesiastical institutions. I ought, perhaps, to have included the Queen's birthday (May 24), for, even in my boyhood, that day was honoured in such a boisterously loyal manner as compared with the non-observance of the anniversary in most Scottish towns, that I cannot help thinking the bonfire raisers may in part have inherited their enthusiasm from the traditions of some ancient festival. The progress of a blazing boat through the streets of Ayr and Newton was the crowning episode of the day. The boat was stolen from the Newton fishermen, and no combustible property was on that day safe from confiscation.

W. SEMPLE.

Dumfries, Scotland, March 1.

Chemistry in Rural Secondary Schools.

PROF. MELDOLA has raised an important question on Mr. Dunstan's letter. Speaking of two rural secondary schools, he says that chemistry (with physics) "has been taught with the greatest success" and is "of distinct value in after life." It would be useful to have information about the careers of the individual boys on which he bases his opinion, and the character of the science teaching in the two schools referred to. My experience with young farmers in Essex has led me to think that the chemistry taught in many rural schools has had too little bearing upon the problems of rural life to be of much practical use, and school life is too short to admit of a science being taught as a means of mental discipline unless at the same time the pupils are building up knowledge that is essential to future progress.

The county institution at Chelmsford to which Prof. Meldola alludes includes schools of horticulture and agriculture. Though not secondary schools, it may be useful to state that, while in teaching horticultural students the biologist found it quite possible to get on without the chemist, in teaching agricultural students the chemist could make little progress without the biologist. It was not that chemistry and physics were not taught to all the students, but that the biologist, *quâ* biologist, necessarily possessed both chemical and physical knowledge, while the chemist, *quâ* chemist, knew no biology. In rural secondary schools biology should be an important subject of instruction, most rural industries being more or less biological. But no progress in biology can be made without an adequate knowledge of chemistry and physics, so that it is not a question of whether these sciences should be taught—there can be no possible doubt about that—but how they are taught. The teacher needs to be essentially a biologist, or at any rate to have studied science in a biological atmosphere, *e.g.* in an agricultural college, in order to be able to teach chemistry as a natural science and build up a knowledge of its principles by the study of substances and phenomena that come within the experience of rural life.

To give a concrete case. A common subject of instruction in the chemistry of a rural school is Weldon's process for the recovery of manganese in the manufacture of chlorine. To not one boy in a thousand is the knowledge of this process likely to be useful in after life, unless as cram for an examination. The underlying principles could be just as well illustrated by a study of the process of liming land to neutralise acidity and promote oxidation, a better subject educationally because coming within the boy's own range of experience, and affording knowledge which might be useful to every boy in the school. But how many of the existing rural school science masters possess the knowledge of natural science necessary to deal with it?

T. S. DYMOND.

Savile Club, W., April 15.

Diurnal Periodicity of Ionisation of Gases.

IN the course of some experiments on the spontaneous ionisation of air and other gases in closed vessels, Mr. N. R. Campbell and I have detected a well marked periodicity in its value. It has two maxima and two minima in each twenty-four hours, the maxima occurring between 8 a.m. and 10 a.m. and between 10 p.m. and 1 a.m. at night, while the minima occur with great regularity at or near 2 p.m. and 4 a.m. The form of the curve drawn for the observations of any single day is, as a rule, sufficiently well marked for the maxima and minima to be apparent, while if the mean of the observations for several days be taken, the form of the resulting curve is unmistakable.

The cause of this periodicity has not, as yet, been determined. A continuous record of the temperature of the laboratory was taken, and it was found to have a simple daily period with a maximum during the day and a very regular minimum at 7 a.m. The temperature fell steadily from 6 p.m. until seven o'clock the following morning, and, as during this interval the ionisation rises to a maximum, falls to a minimum, and then rises to a maximum again, it does not seem possible to connect the variations with temperature.

On the other hand, the variations of atmospheric potential show some striking parallel features. This quantity has a double daily period. Its maxima, like those of the ionisation, are not very well defined, and occur about the same times. The minima in both cases are remarkably constant, and occur at exactly the same hours—2 p.m. and 4 a.m. The irregularities in the atmospheric potential curves are less marked during the night than during the day—an observation which holds also for the ionisation curves. Lastly, this diurnal variation of the atmospheric potential is most marked in February, and it was in the ionisation curves for February that the periodicity was first noticed.

This and other possible causes of the periodicity are at present being investigated, and although the research is necessarily a slow one, we hope soon to be in a position to publish a full account of the work.

ALEX. WOOD.

Cavendish Laboratory, Cambridge, April 9.