copper, and then contains a higher percentage of aluminium, and always contains nitrogen. It has a resinous lustre, and decomposes water at 100°.

A paper by Clifford Richardson, on some constituents of the embryo of wheat, showed the unexpected presence of a soft wax, cane-sugar to the amount of more than ten per cent, a new saccharoid, and allantoin, a nitrogenous substance of the uric acid series, together with other similar substances not yet isolated. The relations of these substances to the transfer of nitrogen in the plant were discussed.

William McNurtrie described the chemical examination of specimens of ropy milk and cream, which description, together with the discussion which ensued, showed that this unfortunate condition is brought about probably by some organism, and that cleanliness and disinfection are the best means of prevention.

The poisonous matter sometimes occurring in old cheese and ice-cream, which he has named 'tyrotoxicon,' was described by V. C. Vaughan. He showed it to be of ptomaine nature, and had been able to induce its formation in a mixture of milk, sugar, and eggs, by inoculation with a small portion of ice-cream which contains the poison. This would seem to point to its origin in the growth of some microbe. Its toxic effect is shown in the extremely rapid production of symptoms similar to those observed in cholera infantum.

Thomas Taylor presented an exposition of his views on the characteristic differences in fat crystals, which have already attracted considerable notice in print, and are well known to most of our readers.

Other papers read were as follows: 'Action of heat on ethylene,' by L. M. Norton; 'A new viscometer,' by S. M. Babcock; 'Method for the determination of the melting-point of fats,' and 'The areometric method of estimating fat in milk,' by H. W. Wiley; 'Manufacture of sodium carbonate,' by Adolf Kayser, presented by Alfred B. Young; 'Substituted acrylic and propiaric acids,' by C. F. Mabery; 'Determination of caffeine,' by Dr. Hodgson Ellis; 'Composition of soiling rye,' by William Frear; 'Preliminary analysis of leaves of Juglans nigra,' by Lillie J. Martin; 'Some laws of chemical union,' by C. F. de Laudero and Paul Prieto, read by the secretary; and 'The torsion analytical balance,' by A. S. Springer.

AN exhibition of apparatus for the destruction of parasites of cultivated plants will be held at the Horticultural school in Florence during October.

PROCEEDINGS OF THE SECTION OF PHYSICS.

THE first matter presented to the section was a recently devised instrument, by Mr. John A. Brashear, which he terms a 'gravity parallelometer. It is used in making the surfaces of a plate of plane glass truly parallel. The art of executing a single plane surface has been carried to a very high degree of perfection, but peculiar difficulties are encountered in making two surfaces parallel. By Mr. Brashear's method a variation in thickness of $\frac{1}{50000}$ of an inch can be detected. In one case, two surfaces about a quarter of an inch apart were made so nearly parallel, that, were they extended, they would not meet in five miles.

Prof. W. A. Rogers described the combined yard and metre, which will be used by the department of standards of the British board of trade in a definite determination of their relative lengths. The latest value of the metre in English measure is 39.37012 inches.

Prof. J. W. Sanborn has been for several years experimenting on the relation of dew to soil-moisture. One means of investigation has been to weigh prepared portions of soil night and morning. His conclusion is, that, except in rare cases, the idea that the soil receives moisture at night is false, and the contrary is really true. This applies where there is no vegetation.

Major H. E. Alvord presented the results of extensive temperature observations at Houghton farm relative to dew formation. Thermometers were placed so as to determine the temperature from several inches below the surface of the ground to about four feet above the surface. The results, from observations during several months in the summer of 1884, show that the minimum temperature during dew formation is about four inches above the ground, which was not unfrequently six or eight degrees lower than the temperature at the surface. The temperature at the surface was less than the temperature several inches lower. Some surprise was expressed at these results, and the dew problem was regarded as still more perplexing. The temperature of the surface on which the dew is formed is an essential factor in the solution. Discussion showed the difficulty in determining the exact temperature of the surface particles, which differs from that of the earth above or of the soil below, and the total inadequacy of the mercury thermometer as a means of determining it.

Prof. T. C. Mendenhall prefaced his paper on electric thermometry by saying that the strictures upon the mercurial thermometer should not be

carried too far. It has been of great value, though it may now fail to meet new demands. Electric thermometry is receiving especial investigation at the signal office, particularly from the meteorological stand-point, with some promising results. Professor Mendenhall reported the progress which had been made in the study of atmospheric electricity during the past year. It is not time to begin to think of the origin of atmospheric electricity. The problem is its distribution and the relation, if there be any, to weather changes. Some very interesting results have been reached. In ordinary weather the electrical condition is undergoing constant and rather wide variations, which are very local, as two collectors only a few feet apart may give curves differing considerably, though similar in their wider variations. When an electrical storm occurs, the curves over a wide area may be similar in general outline.

Professor Mendenhall also noted a phenomenon entirely new to him; namely, that resistance coils, after a current is passed through them for some time, upon short-circuiting, will yield a reverse current for hours. This phenomenon can no doubt be classed under the general head of polarization, yet by simple polarization it would be difficult to account for persistence of current. This makes caution necessary in the use of resistance coils, in order that any effects of this kind may be carefully noted. In one instance the apparent resistance of a coil was found to increase fourfold when the current was reversed.

Prof. W. A. Anthony reported the results of experiments showing an increase in the torsional elasticity of metallic wires. In the case of a certain phosphor-bronze wire, it has been increasing, at a decreasing rate, for nine months. Various metals have been investigated. Steel is scarcely better than brass and other substances, and they all show a much wider change than the bronze. To determine whether the phenomenon is dependent upon the age of the wire and the condition to which it is subjected, a piece of wire was freshly drawn. A portion forty centimetres long was used in a torsion pendulum. The period changed from 9.575 seconds to 9.526 seconds in four days. The curve representing the time of vibration shows that the change occurred less rapidly each day. Another piece of the wire, which had been drawn at the same time, and which had been subject to no strain of any kind, was then tested. The curve for this wire was not a duplication, but was almost an exact continuation of the former curve, showing that the same changes had been going on in the two wires. The temperature co-efficient seems to change with the change in torsional elasticity.

The following papers were also presented: 'Counteracting the effect of change of level of the torsion balance,' by Prof. Wm. Kent; 'Time of contact between the hammer and the string in a piano,' by Prof. C. K. Wead; and 'Registering small variations of speed of machinery,' by Prof. W. A. Anthony.

PARIS LETTER.

M. PENNETIER, at a recent meeting of the Academy of sciences, gave the results of experiments of fourteen years' duration concerning the revivification of small animals, such as rotifers and Anguillula tritici, after a protracted state of apparent death due to dehydration. The results are the following: Anguillulae, which M. Pennetier had kept, year after year, in a state of apparent death and in great numbers, have ceased to be subject to revivification, upon being put in moist conditions, after fourteen years. Up to this date, they regained movement and life easily enough, but after it none of them could be brought back to life. M. Vulpian remarked, *à propos* of M. Pennetier's experiments, that he had noticed that every year the number of dehydrated animals that can be recalled to existence decreases regularly, and that most likely the process of desiccation works in the animals some progressive alterations of an unknown nature, which lead to results incompatible with life. M. Vulpian argues also that it cannot be death that desiccation induces; it can only be some sort of lethargy during which life-phenomena and manifestations are at the lowest. This conclusion will be indorsed by most biologists.

This question of the revivification of desiccated animals was treated in a very interesting manner some twenty-five years ago by Broca. Leuwenhoeck was the first who noticed the fact, and Needham and Henry Baker (1743), Spallanzani and Fontana, soon followed. During the present century, Doyère, Pouchet, and Davaine investigated the subject with great care. They found that the facts were quite true; but while Pouchet, following Leuwenhoeck, believed that there was no real death in the case, and that it was only a very good imitation of it, Doyère, following Spallanzani, believed that the desiccated animals were really dead, and that their revivification was a real resuscitation, a new creation of life. In 1860 a committee was appointed by the Société de biologie for the purpose of investigating the question. Brown-Sequard, Balbiani, Berthelot, Dareste, and Robin were members of this committee: Broca had charge of summarizing the results and drawing up the report of the committee. This report was published in 1860, and it remains one of the