same manner, left the animals in perfect health. This certainly would demonstrate toxic qualities for the dead bacilli when absorbed by the living body.

— Dr. McEachran, live-stock inspector for Canada, is opposed to the inoculation of cattle for the prevention of pleuro-pneumonia. He believes, that, in every country in the world where it has been impartially tried and reported on, the report has been unfavorable. He regards it as a dangerous operation, and not warranted by any known benefits. Many die from the operation itself, and wherever it is practised it has to be kept up. Thus in Scotland, where inoculation is practised, there is a constant supply of the virus; and the cities of Glasgow and Edinburgh are active centres of the disease.

— The recently held meeting of the French congress of surgeons was a very notable one. M. Ollier of Lyons, well known for his experiments in bone-grafting, presided at the meeting, which was attended by many of the most eminent surgeons of France, as well as by other men of note, among whom were the president of the senate and the rector of the university. The most interesting discussion was that in regard to tetanus, or, as it is commonly called, lockjaw. It was opened by M. Vaslin of Angers. He regards it as a purely nervous disease, and, in support of his views, narrated a case which had come under his own observation, in which the disease was due solely to emotional causes, and which was cured by chloral and morphine. Professor Balestreri of Genoa concurred with M. Vaslin, and related several cases which he had treated, and which were successful. Professor Thirier of Brussels, on the other hand, believed tetanus to be contagious and of a parasitic nature. M. Mannoury of Chartres denied its contagiousness, and said, that, after conferring with a good many veterinarians, he was unable to learn of a single case in which the disease was communicated from one animal to another. Professor Verneuil of Paris is a firm believer in the contagiousness of tetanus, and thinks that it can be contracted by man from the horse. He said that human beings are often attacked with tetanus when living with or near animals affected with the disease, and that it often follows horse-bites. Wounds which have in any way come in contact with earth or straw soiled by horses are more liable to be accompanied by tetanus than others; and the disease is most frequent among stable-boys, horse-dealers, and, in general, those whose duties bring them in contact with horses. Notwithstanding all these arguments, it was generally admitted that all attempts to convey the disease experimentally from an affected animal to a healthy one had failed. M. Blanc of Bombay thought the disease to be contagious, and communicated sometimes through infected water. Interesting papers were read on bone-grafting, and the uniting of divided nerves by suturing. The author of the latter paper believed that severed nerves may be made to unite in a few hours.

— The sermons and autobiography of Mark Pattison, late master of Lincoln college, Oxford, excited such general interest, that arrangements are making to publish a volume of selections from Mr. Pattison's miscellaneous writings.

LETTERS TO THE EDITOR.

***Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Polarization of resistance coils.

IN August last Professor Mendenhall, in conversation with the writer, alluded to his observation of the polarization of certain resistance coils, and suggested an examination of the coils in this laboratory. The examination was made, and the results stated in remarks upon Professor Mendenhall's paper at the Buffalo meeting of the American association. A brief account may not be without interest and value.

The idea entertained by Professor Mendenhall at the time seemed to be that the polarization was of a 'statical' nature; the deflection obtained on connecting the coil, through which a current had been passed, with a galvanometer, being produced by the 'residual charge.' The examination of our coils was undertaken with the same idea, the 'condenser discharge' method being made use of, substituting the coil under trial for the condenser. The galvanometer was a 6,000 ohm astatic Thomson, by Elliott Brothers, its needle making a vibration in about ten seconds. A Fuller cell and Sabine discharge key were used. Polarization was found in every coil in the laboratory, except in a standard B.A. unit from Elliott Brothers. It was also found in a Hartmann box loaned for examination by Messrs. Queen & Co. The effect was found to vary widely in different coils in the same box, particularly so in a box of 100,000 units from Elliott's, whose 40,000 coil gave 40 degrees deflection against 6 or 7 degrees for any other coil in the box. On opening the box, it was found that the 40,000 coil had been heated till the paraffine had melted and some of it had run off, while the other coils were well covered, as usual in Elliott coils. The Hartmann box, whose coils were not paraffined, showed the effect more strongly than any except the 40,000 Elliott. It was observed that the coil terminal connected to the positive pole of the battery in charging, was itself positive in discharging; that reversing the battery reversed the discharge deflection; that the deflection was not momentary, as with condensers, but that it indicated a steady current, diminishing slowly, but not ceasing in some instances after eight or ten hours; that when the coil was charged by battery for several minutes, and then the current reversed and allowed to flow a few minutes longer, the discharge current was at first due to the last charging current, but after a time it ceased, and was followed by another

discharge current due to the first charging. An experimental coil was then made up of 1,800 ohms of wire having unparaffined cotton insulation. It was wound on a warm rainy day, and tested immediately, showing the strongest polarization found, driving the spot of light violently off the scale. The coil was then baked in a hot-air oven at 150° C. for an hour, and tested again when cool. No trace of polarization could then be found, though the charging current was increased. The previous observations of course indicated electrolytic polarization as the disturbing cause; and the last showed, that, in the case of that coil, it was electrolysis of water absorbed from the air by the cotton insulation. The experimental coil was then heated, and soaked well with pure paraffine, and drained while hot until it seemed to be as nearly as possible in the same condition as the 40,000 Elliott coil, and tested when cool. No trace of polarization was shown. It was then put aside in the instrument case to see whether it could still absorb water enough to polarize. Ten days later, just after the Buffalo meeting, the coil was tested again and polarized strongly. On heating it again, the polarization entirely disappeared. A drop of hydrant water placed on the coil caused polarization to re-appear in five seconds, and in five minutes the effect was so strong as to drive the needle to its stops.

The degree of error in measurement resulting from polarization was not examined, but Professor Mendenhall's statements show that it may be a considerable quantity.

It is obvious that unparaffined coils are, on this account, unsuited to the best work; also that coils well paraffined (as in the B.A. unit coil) or coils freshly baked and paraffined are free from such error.

The paraffining of ordinary coils, even when as thoroughly done as by the Elliotts, is not a permanent protection, probably because of cracking of the mass of paraffine, allowing vapor to reach the wire and insulation. A test will quickly determine the condition of any particular coil. A box might be made proof against polarization by filling entirely the space about the freshly baked coils with pure paraffine, just warm enough to flow freely. Temperature difficulties could be in part overcome by thermo-junctions, as in standards. Another and on some accounts better plan would be to mount the coils in an impervious box with liquid-tight joints, and filling the interior with a petroleum oil, which may readily be found in market, of such quality as to exhibit no polarization. With such a box, there need be no uncertainty as to the temperature of the coils.

BENJ. F. THOMAS.

Columbus, O., Dec. 27.

Atmospheric lines in the solar spectrum.

The ingenious device recently published by Mr. Conner, for detecting the lines in the solar spectrum due to the earth's atmosphere, recalls a similar plan proposed by the writer some years ago. In a letter dated Feb. 21, 1883, I wrote to Professor Rowland, "I hope that you will try the experiment of which I spoke to you last summer, — forming two images of the sun, and photographing the spectra of the opposite limbs. A glance would serve to distinguish the solar from the telluric lines." An accompanying sketch showed that a double-image prism was to be placed between the slit and a lens forming an image of the sun upon it. This prism was to be moved until the two images were in contact. The east and west limbs were thus brought together, and the slit was placed at right angles to their line of junction. In the photograph, telluric lines should cross the spectrum undeviated, while solar lines would be bent in opposite directions where they crossed the line of separation of the two spectra. The advantages of this method over that of Mr. Conner are, first, its simplicity, as it is easily tried by any one who has a spectroscope giving a sufficient diffusion; secondly, the solar lines, instead of becoming hazy, continue well defined. For these reasons I call attention to the matter, and not to detract from the credit due to the eminent French physicist, who has preceded me both in trying and publishing a solution of this very important problem.

EDWARD C. PICKERING.

Harvard coll. observ., Jan. 1, 1887.

A brilliant meteor.

On Jan. 3, 1887, at 5.15 P.M., I observed a meteor of unusual brilliancy. It started, as nearly as I could make out, from the constellation Ursa Minor, possibly a little higher up, moving with a rapid rush and brilliant light in an easterly direction. As it neared the horizon, its speed apparently diminished, until it disappeared behind some trees. It was visible fully thirty seconds, and, during the last part of its flight, appeared to float slowly downwards. A trail of considerable length was drawn behind, giving it the appearance of a large rocket. Its flight was unattended by any sound.

R. W. WOOD, Jr.

Jamaica Plain, Mass.

What was the rose of Sharon?

I notice in your issue of Dec. 31 an article on the rose of Sharon. Without desiring to enter into the discussion of this subject, I wish to refer those interested to a few words upon this subject by an eminent investigator. Speaking of that part of the pleistocene plain near Jaffa, bordering the Mediterranean Sea, Sir J. W. Dawson, in his recent work on 'Egypt and Syria,' says, "In February we found it gay with the beautiful crimson anemone (A. coronaria), which we were quite willing to accept as the 'rose of Sharon,' while a little yellowish-white iris, of more modest appearance, growing along with it, represented the 'lily-of-the-valley' of Solomon's song." From this would it not be reasonable to infer that this anemone is quite generally recognized as the 'rose of Sharon'?

AMOS W. BUTLER.

Brookville, Ind., Jan. 3, 1887.

Electrical phenomena on a mountain.

In confirmation of the observations of M. F. (*Science*, viii. p. 564) in relation to electrical phenomena on Lone Mountain, near Bozeman, I beg leave to call attention to the fact that more than twelve years ago Mr. Franklin Rhoda, assistant topographer, in his 'Report on the topography of the San Juan country' (*vide* F. V. Hayden's *Report of U.S. geological and geographical survey of the territories for the year* 1874, pp. 456–458, also p. 461), gives a detailed and graphic account of similar electrical manifestations experienced by Mr. A. D. Wilson and