

planted black powder for sporting purposes. The utility of the new powder for military purposes was evident to civilians from the beginning, but our military authorities, after testing it, said that it could not be adopted, because the trajectory was so much flatter than any powder then in use, and that the sights of all army rifles would require alteration. The British rifles being so short-sighted, he had no option but to turn to our neighbours of France. In November, 1881, he showed the powder and method of manufacture to the military attaché at the French Embassy, but it was some time afterwards before the French produced their powder "B," and this forced the hand of our military authorities at home. To-day, even the sights of our military rifles had been altered; in fact, he believed there was no part of either rifle or cartridge that had not been altered, and the art of war had been changed throughout the world.

Fifteen years after the process had been worked out, he learned that a German botanist, Hartig, had made experiments in the same direction in 1847. The pamphlet in which he described his experiments was extremely scarce. He knew of only one copy of it in Great Britain, and he had been unable to obtain it in Germany, so that his ignorance on the subject in 1881 might perhaps be excused.

The president next gave illustrations of the discovery of the method of silvering glass, a paper on which was written as long ago as 1867 by Justus von Liebig; of the discovery of Portland cement by Aspdin, the Leeds mason; and how both these discoveries led to important industrial results. He showed how fogged photographic plates led to the discovery of the Röntgen rays. Bolsover, in repairing the handle of a knife composed partly of silver and partly of copper noticed that these metals adhered to one another when fused. This laid the foundation for Sheffield plate. Dr. John Wright's invention of the use of cyanide of potassium in electro-plating was the outcome of research, and about the same time another inventor was busy on the same subject. One of the brothers Siemens found a method of electro-plating which he considered new, and brought it to England, where he offered it to Elkington. The latter was able to show him an almost identical process already at work. Mr. Reid next referred to the discovery of the vulcanising of india rubber by Hancock, which showed the necessity, not only of patient work, but also of perseverance and careful observation. Hancock had made a number of mixtures of india rubber with various substances, none of which appeared to have any particular advantage. The samples were put on one side for some months, when the whole of them were treated with oil. It was noticed that a portion of one sample was not acted upon by the oil, and on looking up his records of the samples Hancock found that this particular one had been heated to about 300° F., and that it contained sulphur. Incidents of this kind could be multiplied. He hoped he had shown the younger members of the society the advantages, first, of original work in connection with their industries; secondly, of careful observation and diligent inquiry into anything that might appear new to them; and thirdly, of perseverance until they had obtained some definite result.

TRIALS OF ROAD MATERIALS AND CONSTRUCTION.

THE use of motor vehicles has so completely altered the conditions of the wear and tear of the roads, that it has become necessary to find some new method of maintaining the surface and preventing the nuisance of the dust arising from the wear of the surface by the wheels of the motors. During the last few years various processes have been tried, chiefly directed to finding some more durable means of binding the surface material with which the roads are covered. The most successful so far have been by the use of tar asphalt or oil for binding the broken granite or other road material used for repair.

The new Road Board, with the view of securing a service test under uniform conditions, has made arrangements with the Kent County Council for carrying out a series of experiments on trial lengths of a main road, to be carried out under the direction of its advisory engineering committee. The site selected for these experimental trials is on the main road from London to Folkestone between Eltham and Sidcup. This road is thoroughly representa-

tive of the average condition of heavy road traffic. The average number of vehicles using this road in one day includes 322 motors of all kinds, and 454 horse-drawn vehicles, the traffic density amounting to 500 tons per yard of width.

The experiments are to be carried out under the direction and superintendence of Mr. Maybury, the county surveyor of Kent, who has paid special attention to this subject, and has so far succeeded in maintaining the surface of the main roads in Kent in excellent order. The special subjects to be taken into consideration are:—The first cost of the coating, and the future cost of maintenance and efficiency. Twenty-three different processes are to be given a trial, each extending over a length of a hundred yards. They include ordinary water-laid and rolled macadam; the same with a tared surface; tar macadam; and several patent processes.

Arrangements have been made for an inspection of the work while it is going on by those interested, and a pamphlet has been issued by the Road Board, giving full particulars and copies of the conditions and specifications under which the trials are to be carried out. This pamphlet is to be obtained at Messrs. Waterlow and Sons, London Wall, E.C.; price eightpence.

METEOROLOGICAL REPORTS.

PHILIPPINE WEATHER BUREAU (1908).—The part of the annual report now received includes (1) the administrative report for the fiscal year ending June 30, 1908, and (2) hourly meteorological observations made at the Manila Central Observatory during the calendar year 1908. The activity and popularity of the department dealing with storm warnings may be gauged from the fact that during a typhoon 160 telephonic inquiries were received in a single day. Telegraphic observations were received twice daily from twenty-nine foreign stations, and include reports from Japan, China coast, Formosa, and Indo-China. Special attention is directed to the "immense service" to shipping and other interests which the Eastern Extension and Great Northern Telegraph Companies have for years rendered in allowing free transmission of meteorological messages. The mean temperature of the year 1908 was 79.2° (rather below the normal); the maximum, 97.2°, occurred in May, and the minimum, 61.7°, in February. The rainfall was 97.7 inches (about 2½ inches above the normal); none fell in April (the average being 1.2 inches). Among the large number of seismic disturbances reported from different localities in the fiscal year only one violent shock occurred, viz. on November 24, 1907, in south-east Luzon.

Davos Meteorological Station (1910).—The annual summary, printed as a supplement to the monthly weather charts published by the Curverein, gives the mean maximum temperature in January and July, respectively, as 29.7° and 59.5° F.; mean minimum, 12.9° and 39.6°; absolute maximum, 77.5°, in July; minimum, -9.6°, in February. Rain (and melted snow) amounted to 45.6 inches (9.3 inches above the normal). Snow fell in every month except June and August. Sunshine was recorded during 1605.6 hours, which was much below the average (1790.7 hours for 1885-1905).

Bombay and Alibag Observatories (1910).—The mean temperature of the year was 79.1°, being 0.3° below the normal; the maximum hourly temperature was 92.7°, in June, and the minimum 61.5°, in January. The rainfall was 67.86 inches, being 7.3 inches below the normal (1873-96); June received a fall of 23.92 inches, being 3½ inches above the average. Milne's seismograph registered fifty-seven earthquakes; those of November 9 and December 13 and 16 were great disturbances. The mean magnetic declination was 0° 57' 43" E.; inclination, 23° 35.7'; horizontal force, 0.36845 C.G.S. units. During the year there were 102 calm days, 236 days of small, 25 days of moderate, and 2 days of great disturbance. Part of the observatory is still infested by white ants, although the floor has been cemented; it is now proposed to use Minton tiles.

Falmouth Observatory (1910).—The report of this important station, maintained by the Royal Cornwall Polytechnic Society, and one of the normal meteorological