

that in the six minutes covered by the shock and wave 60,000 persons perished. The centre of disturbance in this case was out under the Atlantic; in the late Spanish earthquakes the centre has not yet been determined, but will possibly be altogether outside of Spain, to the southward.

An English Professor in the Imperial University of Tokio, Japan, has recently established a station for the observation of vibrations of the earth at a considerable distance beneath the surface, from which interesting results and a large fund of new information are expected. Japan is peculiarly well situated for such work, being in the centre of an immense line of volcanic activity surrounding the whole Pacific Ocean from New Zealand through the Solomon and Philippine Islands, the Kamtschatkan and Aliaskan Peninsulas, the Rocky Mountains and the Andes, to Cape Horn, and being besides so subject to frequent shocks of earthquake that the buildings in the country are specially designed to withstand them.

THE centennial of the first balloon voyage ever made across the English Channel was celebrated at Boston on the 7th of January, by the grandson of Dr. John Jefferies, the successful aeronaut. Within these one hundred years much progress has been made in aerial navigation, and the recent performances of the air-ship of Captains Renard and Krebs seem to promise an early satisfactory solution of the problem. Their balloon is the result of experiments made in the interests of French military science, and conducted for six years past with the greatest secrecy in the forest of Meudon. For this Gambetta's Government granted 100,000 francs. Their balloon is one hundred and sixty-four feet long, by twenty-seven and a-half feet in diameter, furnished with a propeller worked by a powerful but light motor. They have reached a speed of about 6.5 metres a second, equivalent to 14.6 miles per hour, with a five-horse power motor and fifty revolutions of the screw a minute. On the 9th November they went about two and a-half miles with the wind, and returned easily to their starting point against it. This seems to indicate that navigation of the air by means of long balloons provided with propelling apparatus is more than a possibility, though not yet a complete success. In the opinion of those best qualified to judge, fifteen miles an hour is a low average of the speed of the air currents in which even on a calm day a balloon floats, and a solution of the problem will only be approached when the balloon can be propelled for some time at a greater rate. This much at least is demonstrated, that to be practicable and useful, aerial ships must be very long, so as to carry very large machines capable of giving a speed of from twenty to twenty-five miles per hour, allowing of their working in moderate weather. When the wind is high aerial ships must remain in port as other vessels do. The accomplishing of these conditions becomes now only a question of capital. The balloon of Captains Renard and Krebs is by no means the first that has been provided with means of propulsion. In 1852 a steam-screw balloon attained a speed of about four metres a second. In 1872 a speed of 2.8 metres was obtained with a motor worked by seven men, and the Tissandier brothers, with the first balloon furnished with an electric motor, reached a speed of three metres in 1883, and of nearly four in 1884.

It is proposed to utilize balloons in the United States Meteorological Service for taking observations in the upper strata of the atmosphere during storms; the ascensions being made in the immediate centres of storms by aeronauts accompanied by officers of the Signal Service. It is believed that much valuable information as to the nature and direction of storm currents may be obtained by this novel means. The first of these ascensions was made from Philadelphia last month, but, in consequence of a delay of some hours in inflating the balloon, does not appear to have been so successful as was hoped.

DURING 1884 five comets were seen, all of them telescopic. The first belongs properly to 1883 because, although not seen till the 7th January following, it passed perihelion on Christmas day of that year. It was found by Ross, an amateur observer in Australia. The first comet of 1884 in order of perihelion passage was the Pons comet of 1812, found by Brooks at Phelps, N.Y., on 1st September, 1883. The next was found by E. E. Barnard, of Nashville, Tennessee, on the 16th July, and has a period of about five and a-half years. The third was discovered on the 17th September by Wolf, a student at Heidelberg, and is still under observation. It has been assigned a period of about 6.7 years, but there is no record of any previous appearance. This is possibly accounted for by the fact that in 1875 it passed so close to Jupiter that it must have suffered considerable perturbation, and may have had its orbit entirely changed. Eacke's comet, the most interesting of all the short period comets, was reported by Professor Young late in the year, but will not reach perihelion till March. A suspected comet completes the list. A faint nebulous object was found by Spitaler of Vienna while searching for the third comet of 1858 of which the return was expected. When the weather permitted renewed observations it had disappeared, and it will remain doubtful whether this was the expected visitor.

TEN new asteroids were discovered last year, which brings the total number up to two hundred and forty-five. To Dr. Palisa, of Vienna, belongs the credit of having found seven of them.

MR. R. A. PROCTOR, who is nothing if not sensational, has come to the rescue of the sea-serpent, which has long wanted countenance, and recognizes the truth that there is no scientific reason why such a creature should not exist, and that there is much good evidence to the effect that it actually does exist. In this, as in many other matters, science appears to be following the usual course of human nature in respect to questions of extraordinary phenomena; that is to say, it first ridiculed, then denied, presently doubted, and now seems on the point of accepting. In short, science is becoming much more cautious than formerly in assigning bounds to nature, and is

tending to that position of suspended judgment in which the criterion of acceptance for novel facts is simply a sufficiency of evidence.

If proof of this were wanting, the present attitude of scientific men towards thought-reading and like phenomena would suffice. A society for psychical research has been for some time in operation in England, a professorship has been established in the University of Pennsylvania, and a man appointed to the chair who shall devote his time more especially to the study of the physical manifestations known as spiritualism, for the purpose of testing their truth; the scientific periodicals are devoting considerable space to the discussion of kindred topics, and since the new year the organization of an American Society for Psychical research has been completed at Boston and a scheme of investigation adopted. For the present the work of the Society will be confined largely to experiments in thought transference, with some investigation of hypnotism.

In the paragraph on incandescent electric lighting in the last "Jottings," an unfortunate omission of a couple of lines greatly exercised some of my correspondents, and with reason. While the first part spoke of electric lights in houses, the last portion was intended to refer to their increasing use on passenger steamships, though as printed this does not appear. In this connection A. C. L., of Montreal, reminds me of several interesting facts brought forward by Mr. Preece at the British Association meeting in that city. He hinted that houses might be supplied by storage batteries charged by companies, and put in much as soda-water reservoirs are put into fountains, the exhausted battery being removed each day and recharged for the next night; while by each house having its own battery the current would be quite harmless, as Mr. Preece had proved on his own children. Then as to cost the difference was more apparent than real. Mr. Preece has outside each door, in a well-lighted hall, a knob, pressure on which closes the circuit and lights the room. When the room is left, even for a few minutes, the light is extinguished in a similar manner, whereas with gas, unless one is willing to carry a light or grope about in the dark for matches, one leaves the light burning whether actually needed or not, and it is estimated that gas is used on the average only about half the time it is kept lit. Many other convenient arrangements for ready use of the incandescent light will suggest themselves to the reader.

GRADGRIND.

HERE AND THERE.

A THREAT of a Fenian raid from Buffalo has just produced a really bright little pasquinade in the *Mail*. Anything serious no one apprehends. The last raid was a farce, evidently got up to make the money come. The first was formidable because there were among the raiders soldiers of the Civil War, and because the American Government at that time being in an angry mood was but half inclined to enforce international law. There is no danger of any such laxity now.

THE "Queen versus Bunting" having been removed from the Court of Oyer and Terminer into the Queen's Bench is now in the nature of a civil action, and comes on at the Assizes beginning on the 16th prox., and not at the criminal sittings in April.

A MARKED difference is noticeable in the results of the several classes of the British American Insurance Company's business. The marine department brought a handsome profit, and the Canadian fire branch shows losses to the extent of only 54½ per cent. The English and American business was unprofitable, probably from the great difficulty which arises in the way of control, so much being of necessity left to agents. The lesson is to cultivate the home and neglect the foreign business. The dividend was not paid without drawing upon the reserve, which was reduced from \$173,191 to \$106,646.

THE Ontario Industrial Loan and Investment Company, whose annual statement appears in another column, have earned \$17,218.38 during 1884, which enables them to declare two half-yearly dividends of four and three per cent.—a showing which reflects the greatest credit upon the board which has engineered the company through a period when real estate not less than other businesses has suffered severely from the general depression. The Yonge Street Arcade, it is interesting to note, is already returning five and three-quarters per cent. upon the outlay, with only two-thirds of the building rented.

There were forty-six failures in Canada reported to Bradstreet's during the past week, against thirty-three in the preceding week, and thirty-eight, thirty-nine and fourteen in the corresponding weeks of 1884, 1883, and 1882 respectively. In the United States there were 270 failures reported to the same firm during the week, as compared with 254 in the preceding week, and with 237, 260, and 152, in the corresponding weeks of 1884, 1883 and 1882. About 85 per cent. were those of small traders whose capital was less than \$5,000.

ODD is the fate of such Canadian writers as have to seek an American market for their wares! Last month the editor of a leading magazine in New York accepted a manuscript from a writer in Montreal. "Young man," said the editor, "take out the references which mark your production as Canadian. Here in New York 'Canada' sounds like 'Vermont,' and as a place of origin it will prejudice your article." The prejudice was one which the editor did not share, although as a sensible man he felt bound to recognize it.