

and consequently emit less light. Stopping short at no difficulty, receding from no position, it grasps the universe, analyses it, and calculates its constituent parts, their action and their history, and with no uncertain pen writes down upon the tablets of scientific research marvellous discoveries, each of which has a present and important bearing upon the daily concerns of life.

THE WORLD'S POPULATION.—The United States Bureau of Statistics, getting its information from reliable sources, mainly from a work published at Gotham, by Drs. Behm and Wagner, furnishes the following interesting facts and figures on the above subject:—The aggregate population of the earth is 1,391,032,000. Asia being the most populous section, and containing 798,000,000, while Europe has 300,500,000; Africa, 203,000,000; America, 84,500,000; and Australia and Polynesia, 4,500,000. In Europe the leading nations are credited with the following numbers—Russia, 71,000,000; the German Empire, 41,000,000; France, 36,000,000; Great Britain and Ireland, 32,000,000; Italy, nearly 27,000,000; Spain, 16,500,000, and Turkey, nearly 16,000,000. The other countries do not exceed over 5,000,000 each. In Asia, China, which is by far the most populous nation of the earth, is credited with 425,000,000; Hindostan, with 240,000,000; Japan, 33,000,000; the East India Islands, 30,500,000; Burmah, Siam and Farther India, nearly 26,000,000; Turkey, 13,500,000, and Russia 11,000,000. Australia's population is given at 1,674,500, and the Polynesian Islands, at 2,763,000; New Guinea and New Zealand being included in the latter. In Africa, the chief divisions are West Sudan and the Central Africa Region, 39,000,000; South Africa, 20,250,000; the Gala country and the region east of the White Nile, 15,000,000; Samauli, 8,000,000; Egypt, 8,500,000, and Morocco, 5,000,000. In America, two thirds of the population are north of the isthmus, where the United States has nearly 39,000,000; Mexico, over 9,000,000, and the British Provinces, 4,000,000. The total population of North America is given at 52,000,000, and South America, 25,000,000, of which Brazil has 10,000,000. The West Indies has over 4,000,000, and the Central American States not quite 3,000,000. According to the tables, London, with 3,254,260 inhabitants, is the most populous city in the world, while Philadelphia, 674,022 inhabitants (in 1870), is the eighteenth city in point of population. These 18 cities, in their order, are the following—London, 3,254,260; Sutchan (China), 2,000,000; Paris, 1,851,792; Pekin, 1,300,000; Tschantschau-fu, 1,000,000; Hangtsa-fu, 1,000,000; Siantan, 1,000,000; Sangnan-su, 1,000,000; Canton, 1,000,000; New York, 942,292; Tientsin, 900,000; Vienna, 834,284; Berlin, 826,341; Hankau, 800,000; Tschintu-tu, 800,000; Calcutta, 791,645; Tokio Yeddo, 674,447, and Philadelphia, 674,022. Of cities smaller than Philadelphia, the leading ones are—St. Petersburg, 667,970; Constantinople, 600,000; Glasgow, 594,536; Liverpool, 493,405, and Rio de Janeiro, 420,000.

Telephony is the transmission of sound by electric telegraph, and is of recent discovery. Some time ago Sir William Thompson, in an address to the British Association, gave an account of a successful experiment in sound telegraphing over a distance of several hundred yards. The words were shouted by his assistant while holding his

mouth close to a stretched membrane, carrying a little piece of soft iron, which was thus made to perform in the neighborhood of an electro magnet in circuit with the telegraph wire motions proportional to the sonoric motions of the air. The words thus uttered were distinctly heard by Sir William Thompson, coming from the thin circular disc, which formed the armature of the electro magnet at the other end of the wire, hundreds of yards away from where the words were spoken. This experiment is, however, quite eclipsed by one which took place on October 9, and which we find reported in the *Boston Advertiser*. On the occasion referred to a telephone was placed at each end of a telegraph line, owned by the Wolworth Manufacturing Company, extending from their office in Boston to their factory in Cambridgeport, a distance of about two miles. A conversation was carried on by two electricians for a long time, and the words spoken and heard were accurately reported. A comparison of record shows that the transmission of sound was perfectly accurate, except where words were spoken in a low whisper, when, although the whisper was heard, the words could only now and then be made out. If conversation by telegraph can be successfully carried on over a distance of two miles, why not over hundreds of miles when the mechanical appliances have been perfected? One may yet be able to gossip with a friend in London by Atlantic cable.

THE FIERY LAKE.—A remarkable address has been delivered by Sir William Thompson in the Physical Section of the British Association, on the subject of the fluid or solid nature of the earth's kernel. While not denying that certain portions of the earth's interior are in a molten or fluid state, Sir William Thompson maintained, on various more or less recondit grounds, that no large proportion of the earth's interior can by any possibility be in the condition of molten fluid.

"I may say, with almost perfect certainty, that whatever may be the relative densities of rock, solid and melted, at or about the temperature of liquefaction, it is, I think, quite certain that cold solid rock is denser than hot melted rock; and no possible degree of rigidity in the crust could prevent it from breaking in pieces and sinking wholly below the liquid lava. Something like this may have gone on, and probably did go on, for thousands of years after solidification commenced; surface portions of the melted material losing heat, freezing and sinking immediately, or growing to the thickness of a few metres where the surface would be cool, and the whole solid dense enough to sink.

"This process must go on until the sunk portions of crust build up from the bottom a sufficiently close-ribbed skeleton or frame to allow fresh incrustations to remain, bridging across the now small areas of lava-pools or lakes." That is a striking picture of the growth of the "round earth," which was once supposed to have been made from the first "so fast that it cannot be moved." We are rather sorry to be robbed of the belief in the central lava ocean after all.

HEIGHT OF WAVES.—J. W. Black, in *Nature*, says: "Dr. Scoresby's observations in the North Atlantic record 24 feet, 30 feet, the highest 43 feet, and the mean 18 feet in westerly gales; and the frigate Novara, 20 to 30 feet off the Cape Promontory. French observers in the Bay of Biscay state