sight or in any effect on our weather. After passing the sun the comet can be seen by persons only in the southern hemisphere. It will be nearest to us about the 21st of July, being then 26,000,000 miles from us. This motion and these distances are obtained from computations made by Dr. Tietjen, of Berlin. It is possible that the observations which Dr. Tietjen was able to use were not sufficient to give an exact orbit.

Professor Swift differs widely with other astronomers who have published articles on the subject. He says there is no probability of the tail of the comet enveloping the earth or moon. The elements of this comet do not resemble those of any comet that has appeared during the last 2,000 years. Its orbit no doubt is parabolic, and it is visiting us for the first and last time. In the next two weeks more will be learned of the physical nature of comets by the spectroscope than has been learned in 4,000 years. Indications last night and to-night are of subdivisions of the tail. The comet is large, and so is the nucleus, with a disk more planetary than stellar. Should the tail increase in width as well as in length and envelope the earth we should be insensible to it, the matter composing it being so rare. The rate of motion is now thirty miles per second and directly toward us. On the 10th of July it will be nearest the sun. The tail last evening was seven or eight degrees in length, and on the side nearest the sun it had a bunchy nebulous appearance as though there was a new tail forming. Its brilliancy was a tenth greater than Wednesday evening.

Professor Eastman, of the National Observatory at Washington, says in reply to the question, "Are comets never anything but attenuated gas?"

Never anything more, so far as they have been carefully observed. Through the nucleus of the comet of 1861 I saw stars of the ninth magnitude, and the nucleus of this appears quite as transparent. Indeed, this is but a fourth class comet, at best, and its nucleus is so attenuated that if reduced to a ball of solid matter, you could probably hold it in the palm of your hand.

4. SAFETY OF LIGHTNING RODS.

The smart thunder shock of summer showers should make us think of our lightning rods. The theory of their use is, that certain atmospheric areas become surcharged with the fluid, which will avail itself of the first conductor that presents to equalize itself. If this area happens to be above a building properly protected, the fluid is conducted into the earth, on the same principle that the safety valve allows the escape of surplus steam, thus preventing an explosion. To protect a building against lightning is to offer the fluid a better protector for reaching the earth than is afforded in the building itself. The first thing is to know the weakest points in the dwelling, or those most liable to attract the fluid, and upon them to erect superior conductors. If these conductors are properly adjusted security is complete. They ought to be arranged so as to condnct electricity both ways—*into* as well as *from* the air. Perhaps the air just above the building is in a highly negative condition, at the moment when the opposite condition prevails in the earth about the foundation. This is no doubt seldom the case, but it is a condition that must be provided for to ensure proper protection. A lightning rod is made of two or three parts. The portion above the roof serves to collect the fluid, and the part below to conduct it away. Ordinarily this second part is run a few feet under ground, in which case it is not only useless, but absolutely dangerous. Unless this part terminates in water, or is connected with something of great dispersive capacity, the rod will utterly fail. In houses having gas pipes, a reliable protection will be given by erecting the gathering rods above the roof and connecting them with the pipes in the interior, which form ready conductors, leading eventually into the ground, where the connection with the mains ensures a complete and safe distribution. But in cases where it is found necessary to run the conductor to the ground, it should terminate in a well or some other body of water. If the well is not convenient for the purpose, then a hole should be bored from ten to fifteen feet in depth, and the rod extended into it and packed with freshly-heated charcoal. If these conditions are not observed, the erection of a rod only adds to the danger of being struck with lightning. The material of the conductors is of less consequence than their arrangement. The upper end should be pointed with a platinum needle, and should not be less than one inch in diameter if ten feet above the roof, or two inches if it rise to twenty or thirty feet. The rod below the roof may be made of plain iron, iron rope, copper strap, galvanized iron, or other material. Galvanized iron is probably the best. Sharp turns in running down the building should be avoided, also propinquity to other conducting materials forming part of the building. The more surface there is to the rod the better, because it is on the surface that the fluid passes. All these things being well attended to, no danger need be apprehended.—*London Free Press.*

5. POPULATION OF THE GLOBE.

In an elaborate paper by Behm & Wagner, published in Petermann's *Mittheiungen*, we have the result of a careful inquiry into the present population of the globe, the summation of their result being as follows: Europe, 301,600,000; Asia, 794,000,000; Australia, and Polynesia, 4,365,000; Africa, 192,520,000; America, 84,524,000; or a total of 1,377,000,000. These figures are derived from the estimates or statistics of population for the years 1869, 1870 and 1871. In the enumeration of the population of towns, London stands at the head, with 3,251,000; next Sutchoo, in China, 2,000,000; Paris, 1,835,000; Pekin, 1,684,000; Jedo, 1,554,000; Canton, 1,236,000; Constantinople, 1,075,000; Siang-tau, China, 1,000,000; Tchang-tehoufoo, China, 1,000,000; New York, 942,292; Vienna, 833,855; Berlin, 825,389.

The religious distinctions recorded in the Indian Census, are among the most interesting statistical facts. Unfortunately, the returns are still imperfect, Madras, Bombay, and Scinde, being as yet unascertained. Of those whose creeds are enumerated we find Christians, 107,000; Mahomedans, 35,963,000; Hindoos, 97,351,000; Buddists and Jains, 2,319,151; and "others," 9,135,000.

The Island of Ceylon showed a population of 2,405,287; Singapore had 97,000 inhabitants; Penang, 67,000; Province of Wellesley, 71,900; and Malacca, so recently raised to polemical importance, 77,000. The Island of Hong Kong and the Peninsula of Kow-loon, have an aggregate population of 120,000.

We have thus completed the circuit of the Empire. The result of the survey is briefly summed up in the report, and the figures, coincise and few, are pregnant with interest. "The Empire possesses 7,768,449 square miles of territory. The United Kingdom 121,608 square miles; the Colonies, 6,685,021; India and Ceylon, 962,820. There are 38 persons to the square mile in the Empire; 260 in the United Kingdom, 210 in India, and 141 in the Colonies." It should be observed, however, that in some parts of India the density of population more than equals that of England. The Queen rules over 234,762,593 souls; her people dwell in 44,142,651 houses; the area of the lands they inhabit is not less than 7,769,449 square miles. Never has the census of an Empire so splendid in existence and so imposing in prospect been recorded.

Prof. Tyndall, in a recent lecture on gases, said that a German chemist lately told him that he had submitted hydrogen gas to a pressure of 8,000 atmospheres or 125,000 lbs. per square inch, and, although the iron piston-rod of the apparatus used was actually shortened by the tremendous pressure, the gas showed no signs of liquefaction.

The varying elastic force of vapours may be nicely shown by the following experiment. Take five barometer tubes; fill with mercury in the ordinary way and invert over a cistern of that metal. The mercury will stand at about the same height in all. Let No. 1 which has in the vacumn at the top only mercurial vapour remain to mark the height of the barometric column and, as well, the pressure of mercurial vapour. Introduce into No. 2 a drop of water; into No. 3 a drop of alcohol; into No. 4 a drop of carbon bisulphide; into No. 5 a drop of ether. The mercury will be depressed in each tube by the vapour formed from the evaporation of the liquids introduced and will stand the lowest in No. 5 as ether is the most volatile of them all.

6. WHAT MAKES THE SKY BLUE.

The ethereal blue colour of the sky is due to minute particles of matter which float in the air. Were these particles removed the appearance of the sky would be dead black. It is a fact in optics that exceedingly fine portions of matter disperse or scatter the blue rays of light, coarser portions scatter red rays, still coarser portions scatter all the rays, making white light. The atmosphere is full of aqueous vapour, the particles of which diffuse white light in all directions. When the particles are enlarged, they become visible in the form of clouds. The vapour particles of the white clouds are supposed to be finer and lighter than those af the dark clouds. That the diffusion of light in our atmosphere, the blue colouring of the sky and the colours of the clouds, are due to the presence of matter floating in the air, has been conclusively proven by Tyndall. On passing a beam of sunlight through a glass tube, the beam is rendered brilliantly visible by the reflection of light from the dust particles floating in the air contained in the tube. But on removing the dust particles, which is done by filtering the air by cotton wool, or causing the air to pass over a flame, the beam of light is no longer visible in the tube.—*Scientific American.*