

trolled them; and as for the assertion that the rioters were composed of mechanics, we utterly deny it. Our mechanics as a body, are notoriously intelligent, thinking men; and because a few laborers from the foundries turned out, or were forced to, by the most turbulent, the whole mob has been characterized as a popular outbreak of workingmen. Men who sweep our streets and dig dirt are not mechanics; and it is a libel on the most industrious class of our citizens to say that they formed any considerable portion of the lawless crowd. The real source from which the rioters were encouraged and recruited, was, and is, the mobs of young men who stand about street corners; without any special means of support they are yet dressed in the extreme mode, talk loudly, insult women, and are an unmitigated nuisance. Why they are permitted to thus congregate is a mystery to all well-disposed persons.

The mob who raged uncontrolled during the memorable week past, have had their counterpart in days bygone in large cities abroad; and the fiendish spirit which animated them has been as savagely exhibited in the past as it was but recently. Atrocities of the most appalling kind, wholesale plunder, and indiscriminate destruction, are necessarily the results of mob rule. Let not the lesson be lost upon the authorities here and elsewhere. Mercy to the riotously disposed, is but an encouragement to them to continue their misdeeds; and the only alternative is to meet force with force, and violence by an unrelenting exercise of the full power of the law. Even yet we are told that the riot is not quelled, but has only subsided; and that upon any attempt to carry out the conscription, all the scenes of the last outbreak will be renewed. These threats will not, we trust, deter the authorities from executing the law to the letter. The thunder mutters in the distance, long after the storm has passed; so the turbulent threaten after their power to injure has left them. Watchfulness and determination are yet imperatively necessary; and if these are exercised we have no fear that any renewed lawlessness will again disgrace our city.

#### EXPERIMENTS WITH BOILING WATER.

Some very remarkable observations on the ebullition of water were made several years ago by Professor Donny of Ghent. An account of these was published, and attracted general attention; especially as it was then stated, for the first time, we believe, that water deprived of atmospheric air exploded at a comparatively low temperature. The attention of Mr. W. R. Grove, F. R. S., having been directed to the subject, he has made a large number of experiments with boiling water, of which he lately gave an account before the Chemical Society of London. He placed a flask containing hot water under the receiver of an air-pump, and arranged in connection therewith a platinum wire, which could be heated to a tolerably constant temperature beneath the surface of the water, by a galvanic battery. When the air was exhausted, ebullition occurred at intervals of about a minute, upon which a burst of vapor would almost eject the contents of the flask. On this action increasing, the water would again become perfectly tranquil, and remain so for a minute, when another tumultuous ebullition would occur, to be succeeded by a period of rest; and the same phenomena would be repeated at such regular intervals, that the apparatus might almost serve as an indicator of time. If a thermometer were placed in the flask, it would be found that the temperature alternately rose and fell some few degrees. Indeed it could not be asserted that the boiling point of water was constant, for it depended upon the amount of air in solution; and Mr. Grove believed that no one had yet succeeded in observing the boiling point of absolutely pure water.

As a proof of the difficulty experienced in entirely expelling the air (or dissolved gas) from water, he cited the following experiment:—A long glass tube closed at one extremity, was bent in the middle to nearly a right angle; the closed limb was then half filled with water, from which, by long boiling, the air was supposed to have been expelled; the remaining space in the tube was then completely filled with olive oil, and the open extremity was dipped into a small basin of the same. Heat was then ap-

plied to the tube until the water boiled, and this temperature was maintained for a considerable time. Each bubble of steam which left the surface of the water passed through the column of oil, becoming smaller and smaller during its ascent; but it never condensed without leaving a microscopic bubble of gas, which at length accumulated to such an extent that it could be examined. It was found to consist of pure nitrogen; and he had never succeeded in expelling the whole of this gas from the water. The evaporation of nineteen-twentieths of the water did not secure the remainder from being mixed with nitrogen. On boiling ordinary water, air containing a slightly increased proportion of oxygen was first driven off, the oxygen gradually diminishing until pure nitrogen was expelled. The avidity with which such water again absorbs air is remarkable. In the expressive words of Mr. Grove, "it sucks it up again almost as a sponge takes up water." By a slight modification in the apparatus, the experiment was repeated with mercury, instead of oil, in contact with the boiling water. It furnished a similar result.

A number of facts regarding the solubility of gas in water were finally enumerated. The general conclusion drawn from the experiments, was to the effect that water had a very powerful affinity for the gases of the atmosphere; that the oxygen could be eliminated by several processes, but the nitrogen resisted all attempts to expel it from solution; so much so that it might be doubted whether chemically pure water (i. e., a compound of the two elements, oxygen and hydrogen, only), had ever been prepared; and further, that ebullition (as applied to water), under all circumstances, consisted merely in the production and disengagement of bubbles of aqueous vapor, formed upon a nucleus of permanent gas. The question, therefore, was raised as to whether nitrogen is so absolutely inert a body as had formerly been supposed?

#### ANTIQUITY OF MAN.

The period of man's habitation on this globe, is a question which has lately attracted much attention, and caused great discussion among scientific men, and in the community generally. Not many years since, the opinion was very commonly entertained, based upon Scriptural chronology, that man first appeared upon the earth about six thousand years ago. The sculptured monuments of primeval civilization, as well as the history of all past ages, seem to supply evidence that man is but a creature of yesterday—a comparatively recent dweller on this sphere. Quite lately, however, some curious and interesting relics of pre-historic races have been discovered, which are received by many men of science as furnishing proof of a much higher antiquity than has been usually ascribed to the human race. It is in respect to these relics that the controversy is now raised. We give a *resumé* of the argument—first presenting the subject as it has been understood geologically.

The various strata which compose the crust of the earth appear to have been formed at different periods of time, under different conditions, and of different materials. In one class of rocks, certain fossils are found; in other strata placed above these, different fossils are discovered; and so the paleontological remains continue to vary in the different strata, from the elder to the more recent formations. Geologists do not pretend to tell the exact ages of these successive stratifications; but it is generally believed that great epochs of time—hundreds of thousands of years at least—were necessary to their formation. The ancient seas, lagoons, and swamps, swarmed with strange creatures—mollusca and reptiles—and the dry land occupied for ages by numerous races of animals which in time became extinct, to be replaced by new and higher creations. Fossils of the elephant and rhinoceros have been exhumed from the chalk beds of London, and the clay beds of New York, among which no human remains were found. And thus the general testimony of geology has been regarded as favoring the view which recognizes man as a comparatively modern denizen of the globe; and that his advent occurred only some six thousand years ago. The later discoveries which militate against this theory respecting which some of our religious periodicals have declaimed with greater zeal

than knowledge, are of a peculiar character. To these we will direct attention in scientific order; leaving the facts to make their own proper impression.

The diluvium, or drift, of geologists, consists of deposits of clay, sand, gravel, boulders, &c., extending over a great portion of the earth's surface—from the Polar regions to about 38° latitude, north and south. At one time these were supposed to have resulted from the Noachian deluge. The formation of these diluvial deposits is believed to have preceded the extinction of the *mastodon giganteus*—the bones of which have been found exhumed from bogs on the surface of the drift, in New York and New Jersey. The diluvial deposit containing these remains has been identified on both sides of the Niagara Valley; where it could only have been deposited—according to Sir Charles Lyell—before the chasm was made in the river. By his calculations, the drift period cannot approach to within 30,000 years of the time commonly assigned for the introduction of man upon the earth.

The facts seemingly opposed to such a view are as follows:—A few years since, M. Boucher de Perthes—a French investigator—while examining the gravel-beds of the Somme, France, which have been considered as belonging to the diluvian period—found a number of rude flint hatchets, and spear and arrow-heads. The publication of an account of his discoveries led to similar searches in England, and other parts of Europe; when many relics of the same character were found, mixed, in some cases, with bones of the northern elephant and other animals, which were supposed to have become extinct before man appeared on the globe. Here was apparent evidence, at least 30,000 years prior to the historic period! But some doubt still hovered over this testimony to the great antiquity of our race, no human remains having been observed with the old flint instruments. Such remains, however, have at last "turned up," M. Perthes having discovered a human jaw in the supposed diluvium near Abbeville, France.

The news of this discovery caused intense excitement among the *savans* of Paris and London: and four deputies from the latter city, viz: Mr. Prestwich, Mr. Busk, and Drs. Falconer and Carpenter went over to Paris on the 9th of last month, for the purpose of holding an inquest on this ancient relic of humanity, in conjunction with five members of the Institute of France. When first examined, it was in the condition in which it was when obtained from the gravel-bed, and was considered to be the jaw of an old man of low stature, of a type similar to the Laplander. After a photograph of it had been taken, it was washed, and sawn through the middle. The walls of the bone, and the single tooth remaining, looked so fresh that some doubt was cast upon the genuineness of the discovery. On the suggestion of the president, the commission proceeded to Abbeville, for their own satisfaction, and examined the deposit where the jaw was found. Old flint hatchets and other instruments were there exhumed before the wondering eyes of the members, many of whom were thus convinced of the reliability of the statements made by M. Perthes. But even this was not received by all the assembled *savans* as conclusive proof of the great antiquity of mankind: a different effect was produced. In a published note on the subject, Dr. Falconer says of this venerable memento of the past:—"The character which it presents, taken in connection with the conditions under which it lay, are not consistent with the said jaw being of very great antiquity." When the subject was brought before the French Academy of Science, M. Elie de Beaumont—one of the commissioners—went further than Dr. Falconer, and stated that in his opinion the gravel deposit where it was found did not belong to the diluvian age at all, but was of a more modern date; and that he did not believe in the existence of man contemporaneously with the extinct elephant and rhinoceros of the diluvian era.

This is the position in which, viewed scientifically, the question of the antiquity of the human family now stands. But whatever the result of such investigations may be, it is a singular fact that no human remains of the ante-diluvians spoken of in Scripture have yet been discovered. This circumstance should lead investigators to pause, and not be too hasty in