product due to recent weathering. A slight decay of minute mica plates may be observed, but for practical purposes it amounts to nothing. The outer surfaces of the detached pieces are equally fresh with the inner surfaces. The felspar is scarcely more altered than when the rock was lying unquarried in the hills at Assuan. The decay is not due to chemical decomposition, but to mechanical disintegration.

In preparing the obelisk for its recent coating of paraffine, the workman carefully picked off with small iron tools all the loose scale and exfoliated material still adhering to the solid rock. My friend, Mr. Samuel Parsons, superintendent of parks, informs me that this refuse weighed 780 pounds, — a truly astonishing amount, when we consider that for 3,400 years the obelisk withstood the effects of time better in Egypt than during the last five years in Central park.

In my opinion, the process of disintegration has been an extremely slow one, caused by a constant expansion and contraction of the constituent minerals near the surface, due to diurnal variations in temperature. In a climate like that of New York, where these diurnal changes are frequently excessive at all times of the year, the tension between the minerals would naturally tend to a mechanical disintegration of the rock. Granite being a poor conductor of heat, the effect of these constant changes would be felt only at short distances below the surface, causing in time minute fractures and fissures along lines of weakness. Into these openings percolating waters, upon freezing, would rapidly complete the work of destruction. The result would be what we now find, — a scaling-off, or exfoliation, of the exposed surfaces. In structure the rock of the obelisk is coarse-grained; and the minerals, being less firmly held together than in many more compact varieties, yield more readily to changes of temperature.

Observation showed that decay progressed somewhat more rapidly upon the south and west faces of the obelisk than upon the north and east. Upon the south and west the direct rays of the sun would act more intensely during the day, but the temperature by night would be nearly the same on all sides. Now, if the cause of the decay was due to expansion and contraction, disintegration would be greatest on the surfaces exposed to the severest strain (the south and west), notwithstanding that the opposite sides would be those most exposed to the driving cold storms.

It seems most probable that the obelisk, during its long exposure in Egypt, must have been slowly undergoing change, the minerals losing some of their cohesive power, and only required a lower temperature to hasten what had been in progress for ages.

Upon this subject the experiments of Professor Wigner, published in the *London analyst* of 1878, on rock from the twin obelisk now standing on the Thames embankment, are of considerable interest. Pieces of the twin obelisk were placed at Professor Wigner's disposal by Mr. W. Dixon, the English engineer, who had charge of the removal of the prostrate monolith from Egypt to London. They represented portions from the under surface, which had been buried in sands, and also from the upper exposed surface. Both pieces were found nearly free from chemical decomposition; and analysis showed but slight oxidation of the iron in the surface rock. Experiments, however, upon the absorbent power of water of the two samples, gave widely different results. Professor Wigner estimated that the sound rock, which had been buried in sands, absorbed 7.8 grains of water per square foot of surface; and the weathered or exposed rock, 46.1 grains per square foot of surface, or nearly six times as much as the fresher rock. He says, "The 46 grains from absorption per square foot gives us a comparatively fair estimate of the amount of water which can be retained in the weathered surface, and which is ready, by its expansion and freezing, to split or disintegrate that surface still further." According to Lieutenant-Commander Gorringe, a high authority, the London obelisk, which stood at Alexandria until the early part of the thirteenth century, was probably thrown down by the severe earthquake which visited northern Africa at that time. If we may assume, as is probable, that for the greater part of the 500 years the London obelisk was partially buried in sands, the difference in the absorbent power of water in the two specimens may be taken as measure of the effect of climatic agencies in Egypt during that period.

The New York obelisk, subjected to precisely similar agencies, would be in condition, after its transportation to America, to disintegrate rapidly when exposed to a lower temperature, and the consequent freezing and melting of the water absorbed through the interstices.

ARNOLD HAGUE.

Washington, Dec. 3.

THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

THE American public health association began its thirteenth annual meeting at Washington, Dec. 8.

After the opening ceremonies, a letter was read from the board of health of Montreal, stating that the epidemic of small-pox in that city was started by an imported case from Chicago, Feb. 28 of the

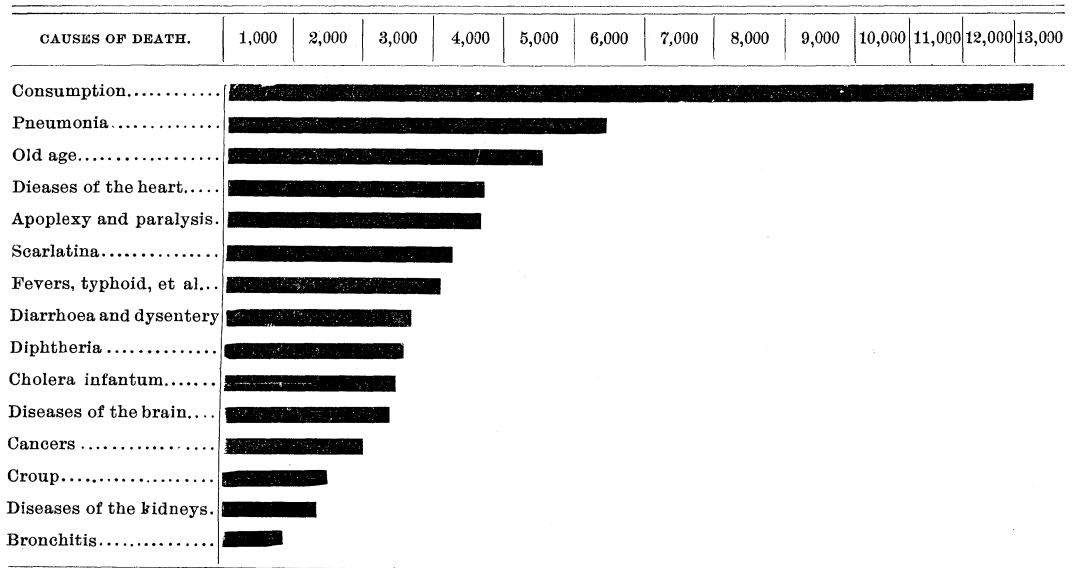
present year; that the spread of the disease was due to the obstinate opposition of the people to vaccination, but that it was now under control, and was fast abating, and the city would be free from the disease by Jan. 1.

The president, secretary, and other members of the Master plumbers' association of the United States, were elected members of the association, together with eighty-eight physicians, engineers, and others interested in sanitation, representing almost every state and territory.

The secretary reported the death of nine of the members, including Dr. Thomas of Savannah, was simply a compilation of statistics, it was not read. It showed that during twenty-five years, 1860–84, there had been in the state 13,000 deaths from consumption, while during the same period there were only 6,500 deaths from pneumonia, 4,000 from scarlet fever, and 1,000 from bronchitis; that consumption was diminishing in the state, especially among the American born; and that in Newport county, not including the city, the deaths from this cause were less than in Washington county, on the other side of the bay. For this no cause had been recognized.

The next paper was on 'Sanitary and statistical

DIAGRAM EXHIBITING THE COMPARATIVE MORTALITY BY ABSOLUTE NUMBER OF DECEDENTS FROM FIFTEEN MOST IMPORTANT CAUSES OF DEATH, IN RHODE ISLAND, DURING TWENTY-FIVE YEARS, FROM 1860 TO 1884 INCLUSIVE.



Dr. Hatch of Sacramento, and Professor McSheny of Baltimore.

The treasurer reported that he had received during the year $3,338.13, had expended $2,233.10, and had on hand $1,105.03, with all debts paid.

A committee appointed for that purpose in 1883 reported that they had incorporated the association for a period of 100 years.

The committee on disinfectants presented their report in printed form, — a volume of nearly 150 pages. The discussion of it was postponed to another day.

A paper was then presented by Charles H. Fisher, M.D., secr. state board of health, Providence, R.I., on 'Statistics of consumption in Rhode Island for a quarter of a century.' As this paper

nomenclature,' by E. M. Hunt, M.D., secr. state board of health, Trenton, N.J. The nomenclature of disease is very imperfect, and as a result there was a vast amount of discussion as to etiology, which would not be if all writers used the same terms with the same meaning. The word 'hygiology' was a far better term than 'sanitation,' or than 'sanitary science.' The word 'medicine' really meant knowledge by measurement, and as used in the expressions 'state' or 'sanitary medicine' was improper and unmeaning. 'State hygiene' would be much better. The terms 'contagion' and 'infection' were also referred to as being used in different senses by various writers, — some by contagions meaning those diseases which are communicated directly by contact; by infections, those

communicated indirectly through media. Webster and other lexicographers use the terms synonymously. Dr. Hunt thinks both terms should be discarded, and the word 'communicable' substituted. The term 'zymotic,' as applied by Tarr, received its impetus from Liebig's 'Chemistry of agriculture;' but there is now, with our present views, no use in retaining it. 'Epidemic,' as applied to those diseases which affect large bodies of the people, as nations; 'endemic,' those which affect localities; and 'sporadic,' which occur isolated, — are used with various meanings. The term 'sporadic' should be abandoned. In concluding, he thought the number of terms now used in the nomenclature of disease could with great advantage to science be reduced at least one-half.

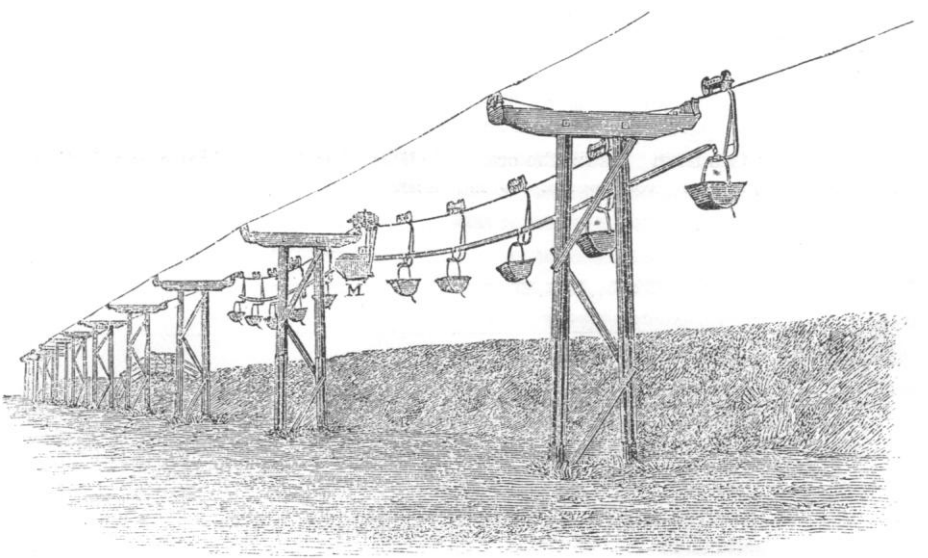


FIG. 1.

TELPHERAGE.[1]

THE experimental telpherage train at Glynde, England, which was described in *Science* of Nov. 13, consists of an electric locomotive, seen in fig. 1 at about the middle of the train, and propelled by the electromotor *M* (fig. 4), and ten skeps, or buckets, which hang by their travelling-wheels from the steel line. Each skep weighs 101 lbs., and carries 250 to 300 lbs. of dry clay; and by distributing these evenly, and somewhat widely apart, the strain on the steel line is small, although the total weight of the train and clay is about two tons; also, as equal weights are simultaneously ascending and descending similar inclines on the several spans, the effect of the sag on the mechanical resistance of the train is neutralized, and little more resistance is experienced than in hauling a similar train along a rigid road.

The automatic governing of the speed of the train is effected in two ways, — first, there is a governor attached to each motor, which interrupts the electric circuit, and cuts off the power when the speed becomes too high; secondly, there is a brake which is brought into action should the speed attain a still higher value. To avoid the formation of a permanent electric arc when the circuit is broken, the governor (fig. 2) is so arranged that the diverging weights are in *unstable* equilibrium between two stops: they fly out at about 1,700 revolutions per minute of the motor, and fly back at about 1,600. When the circuit is closed, the current is conveyed across the metallic contact at *C*. When the weights *W W* fly out, this contact is first broken, but no spark occurs, because a connection of small resistance is continued at *B* between the piece of carbon and a piece of steel, which, being pressed out by a spring, follows the carbon for a short distance as the arm *A* begins to fly out. This contact is next broken, producing an electric arc; which, however, is instantly extinguished by the lever *A* flying out to the dotted position. The brake is shown on fig. 3, and consists simply of a pair of weights, *W W*, which, at a limiting speed greater than 1,700 revolutions per minute of the motor, press the brake-blocks *B B* against the rim *C C*, and introduce the necessary amount of retarding friction. In practice, however, with the gradients such as exist at Glynde, and which do not exceed 1 in 13, the

[1] Condensed from *Nature* of Nov. 5.