

been estimated that a cliff 500 feet high will be worn away at the rate of an inch in a century. This may seem a low rate, but we must bear in mind that along any line of coast there are comparatively few points which are suffering at one time, and that even on these, when a fall of cliff has taken place, the fragments serve as a protection to the coast until they have been gradually removed by the waves. The Wealden Valley is twenty-two miles in breadth, and on these data it has been calculated that the denudation of the Weald must have required more than 150,000,000 of years.—*Lubbock's Pre-historic Times.*

Work and Waste.

Every manifestation of physical force involves the metamorphosis of a certain quantity of matter. Prof. Houghton, of Trinity College, Dublin, asserts, as the result of his investigations, that, in the human organism, there is a definite relation between the amount of force exerted and the amount of urea generated. The urea formed daily in a healthy man, weighing 150 pounds, fluctuates from 400 to 650 grains. Of this, 300 grains are the result of vital work, that is, of force expended in the motions of the digestive organs and the heart, and in sustaining the temperature of the body at a uniform rate. This amount exceeds all other force generated and expended in the system, and is equal to that required to raise 769 tons one foot high. In addition to the mere act of living, the working man undergoes bodily labour equivalent to lifting 200 tons one foot high daily, which requires the formation of 77·38 grains urea. *The force expended in two hours of hard mental labor involves an expenditure of power equal to lifting 222 foot-tons, and a generation of urea weighing 80 grains.* Thus we have a minimum formation of urea during 24 hours, amounting to 477·38 grains, for which there is expended force equal to 969 foot-tons.—*Annual of Scientific Discovery for 1865.*

In commenting on the above, the editor of *The Circular* (Wallingford, Conn.) says:—“Those who fancy that the student or the writer who sits almost motionless at his desk is ‘doing nothing,’ should note the above statements, particularly the one we have italicized. According to the test given by this writer, the brain-worker expends in two hours more lifting force than the Irishman does in a whole day’s digging in a canal.”—*American Artisan.*

Town Sewage.

The Authorities of the “Chorlton” District, England, have instituted an action against the trustees of the Bridgewater Canal, for a Nuisance. The *Gaslight Journal* says:—

The defendants reply, “We are not guilty; we are the sufferers by the pollution of rivers from “which we draw our legitimate supply of water”. The trial will be amusing and profitable to the lawyers. In the end, no matter by whom created, the nuisance must be abated. The residents near polluted rivers and canals now see how fortunate it is that all England was not compelled, as Mr. Chadwick intended, to adopt the water-closet system, before any arrangements had been made or could be made for the construction of intercepting main

sewers. Nothing can be cleaner or more luxurious than the water-closet system where it can be carried out in perfection, as it will be in the metropolis when the Thames embankments and the sub-incumbent sewers are completed. But in many districts of England where physical geographical difficulties are in the way of the safe disposal of sewage rivers, the best security against poisonous nuisance is to be found in dry deodorization. Coal ashes are a wonderful deodorizer, and the mixture is worth something, at the worst and lowest, the cost of cartage for manure, if the quantity weekly produced be not absolutely overwhelming. But then some pains must be taken to mix the dust and the foul stuff by plain sensible directions which working people can understand. The water-closet system in a village or small town deprives the neighbourhood of valuable garden manure, and is often an unmitigated nuisance into the bargain—the cause of chronic stinks on land and poisoned rivers.

Coal-gas Explosions.

If sixteen parts of air be mixed with one of coal gas, the mixture will explode feebly, and with little force; but if the proportions be gradually altered from sixteen parts of air and one of coal gas down to ten parts of air and one of coal gas, the violence or explosive power of the mixture will be seen to increase gradually, until this latter mixture is reached, when the explosive power attains its maximum. If, now, we still go on diminishing the proportion of atmospheric air, we shall perceive that the explosive power of the mixture also diminishes until we reach a point at which two parts only of air are mixed with one of coal gas when the power of explosion in the mixture ceases altogether, or becomes *nil*. Briefly, then, seventeen parts of atmospheric air and one of coal gas will neither explode nor burn; ten parts of air and one of gas will explode violently; and two parts of air and one of gas will burn, but will not explode; and within the range of these limits mixtures may be formed having any required degree of explosive force.—*Scientific American.*

Vegetable Electricity.

A Dr. Baconia, of Milan, who has been experimenting on electricity produced from vegetable substances, finds that a few alternations of slices of beetroot and walnut wood will set free electricity enough to excite convulsions in a frog, when conveyed to its muscles by means of a conductor formed of scurvy grass.

South American Meat.

ANOTHER attempt is being made to bring to Europe the immense supply of good meat wasted in South America. Mr. Liebert, of Hamburgh, has, it is said, attempted the manufacture of Liebig’s “extractum carnis” at Feray Bentos, in Uruguay and sends home about 4,000 lbs. yearly. He is now increasing his establishments, has concluded a contract with the British Admiralty, and hopes soon to supply the extract at 16s. a pound. Each pound is the equivalent of 130 lbs. of meat, and will furnish broth for 128 men. The extract in its best state is absolutely free from fat or gelatine, and is now used very largely in continental hospitals.