

Water-spouts are of frequent occurrence in Lake Ontario, off Sodus Point, where the water is very deep. The great lakes seem to have a subterranean connection with the volcanoes of Hecla, in Iceland. They were also connected with the phenomena of the great earthquake at Lisbon, which occurred on the 1st of November, 1755, and were excessively agitated at the time of that disastrous convulsion, which was felt on all the yet discovered continents of our globe.

The red and green shale underlying the Falls of Niagara, contain saline waters that act upon it with great energy. A large stone-jug of this water—which is as dense as the water of the Dead Sea, and as bitter and acrid—was sent to me from the well at Lockpit. When the canal boatman brought it to the city, in warm weather, it condensed the atmospheric air so rapidly on its surface, as to make a large puddle of water on the floor where it stood. On removing it to my laboratory, where there was much heat at the time, it again condensed the atmosphere so rapidly as to wet the floor to an extent that made it necessary to remove it. I emptied this saline fluid into lead and glass vessels, in which it now is, but the empty stone jug is now half of it in dust having been decomposed by the fluid. I now use this sensitive water for the condensers of my meteoric wires, and Dr. Kane has taken a bottle of it to the North pole with a view of ascertaining what effect the cold of the arctic pole will have upon its fluidity. Here, a zero temperature produces a large crystalline deposit, which, on a change of temperature, produced effervescence beneath the fluid. During certain electric conditions of the atmosphere, the saline properties of the water are conducted on copper wires, and left on its surface, many inches from the condenser, in a state of crystallization. This illustrates the wonders of nature, and accounts for the finding of salt on high mountains up to the line of perpetual congelation; and also accounts for the production of marine shales on mountain heights—for the deluge does not account for that, the flood not having been salt, but fresh water descending from the clouds.

The wear of the Niagara is the question that is at issue; and some say that it would require ten thousand years for the Falls to recede from toward Ontario to their present location. When we look at the great cliffs of the Kentucky river, which has its bed very deep in the bowels of the earth, and then at the channel and bed of the Au Sable, between Keeseville and Lake Champlain, where the river has cut a bed to the depth of one hundred or more feet in the sand-stone, we may have some better idea of the bed of the Niagara.

There were fearful earthquakes in Canada about the years 1662 and 1663, which continued for nearly a whole year. Mountains were sunk. These earthquakes were centred in the northerly and easterly part of the provinces. During my last visit to the Falls, I examined there—in connection with a high ridge between Lake Ontario and the chain of small lakes west—a land which I called the "Land of Flowers." It had the appearance of a primitive garden, and presented a new set of flowers every month during the season of vegetation. On my arrival at Table Rock, a gang of labourers were engaged in cutting through it, to draw off water from the river above the Horse Shoe, for the locomotives at the Suspension Bridge; and seeing me examining these excavations and the debris they had thrown out, they stopped work and kindly aided me in my researches, in which they seemed to take a deep interest. Here I obtained large pieces of *selenite*, *dog-tooth spar*, and *scintillating calcium*—each and all showing that Table Rock, which forms one of the abutments of the Horse Shoe, is a frail and shattered stratum, and is subject to disruption by intense frosts and other extraordinary conditions of the atmosphere.

The salt water, which is contained in the red and green shale which underlies Table Rock, the Horse Shoe, Goat Island, and the American Fall, is too dense in its present state to deposit *selenite*; but mixed with fresh water in such quantity as to reduce it to one hundred degrees by the *salometer*, it will deposit *selenite* so rapidly, and with such force, that, if confined underground, it would gradually lift its surface or break it.

An immense volume of gas arises from the chasm into which the Niagara plunges from the lofty precipices which form the Horse Shoe on the American Fall, and might, with proper apparatus, be ignited—and, when on fire, would greatly exceed in beauty the flames of the gas ascending from the deep ravines of the *salines* of Kanawha, which give a column of flame of seventy feet in height. I have specimens of all these saline waters in my cabinet, with those of the Sea of Sodom; and the rock specimens of all the strata of Niagara, including those of Table Rock and the green shale foundation, with specimens of every foot of strata passed in the sinking of the salt well at Lockpit (401 feet), and Montezuma (600 feet). With these, and abundant other specimens from the same district of country, I have materials with which to form the opinion I here express, that the Falls of Niagara do not date back to any period beyond the universal deluge.

Brooklyn Heights, Sept. 3rd, 1855.

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## Papers on Practical Education.

### PHYSICAL EXERCISES IN EDUCATION.

Few persons can help noticing the physical deterioration of the present race of mankind. On viewing the cumbrous armour and heavy weapons of the knights of old, hung up in some ancestral mansion, or reading of the great exploits of our forefathers, we are forcibly struck with the contrast of the vigour of the present generation. Where can men be found now, who could don the iron case of some old Baron, and go through the manoeuvres of a "military day?" Although the world has advanced in civilization and knowledge, man's bodily powers have diminished in a manner which seems to say, that physical degeneracy is one of the conditions of mental development and enlightened progress.

The principal cause of the defect in the bodily condition of the people, is to be attributed to the manner in which they are nurtured. No means are employed to train children to feats of agility and strength.

In the schools of the higher classes, the scholars enjoy the benefits and pleasures of physical exercises, but our National Schools have yet to look forward for that boon.

The strength and powers of endurance of the people some centuries back, must be attributed, in a great measure, to their early training. Their early years were devoted to athletic sports, and feats of arms, so as to be foremost in the chase, and victorious in the tournament.

The result of such training is seen, in the records of their prowess. If physical training developed such vigour in those days, why is not a similar practice adopted now, to secure such desirable results! Surely, the different callings of labour require as much agility and strength, as the art of coaching the lance, and the management of the war-horse.

Every school ought to have some sort of gymnasium attached to it, where the children's muscles, &c., may be gradually developed, and their several members improved. When a child arrives at the age of four or five, it is sent to school, where it is confined, for the chief part of the day, in an atmosphere which tends to check the bodily growth. This continues for several years, during which the mental faculties are continually employed. If the body be not daily exercised along with the mind—the latter, receiving more than its natural share of nourishment, causes a loss of vigour in the former. In the commercial world supply depends upon demand, so with the different members and parts of the human body. The supply of nourishment to any particular part of man's frame, depends upon the demand there—which demand is regulated in proportion, as that part is called into action. Therefore if any member remains dormant for want of suitable exercise, its undevelopment causes it to lose its natural strength.

Children after confinement in school, throughout the day, require something to call into action every muscle of the body. Their health depends upon it. The majority, if not all of our schools, however, are only provided with a small play ground, where the amusements are confined to shooting marbles, &c. Such a provision alone will not satisfy children's natural wants, and consequently, they grow up, in numberless cases, puny and weak, to find perhaps, a premature grave. No doubt, many persons think, that working men's children have sufficient call for bodily development at home. In some measure this is true, as regards rural districts, but not towns. In the former places, the poor man's child has plenty to do from sunrise to sunset. But do the children become vigorous and well developed men? Let any one take a survey of our rural population, and then make answer. The majority of them seem as unwieldy as polar bears; some carrying their heads a foot in advance of their bodies; others with misshapen legs—and nearly all possessing the most awkward gait. The towns are far worse off than country districts, for the means of athletic exercises. Crowded thoroughfares, and dark alleys form their gymnasium, and the youths' wan looks shew clearly the benefits derived.

So many young men have been returned, as unfit for military service in France, on account of some physical deformity, that the attention of the Government has been drawn to it, and means have been taken to remedy the evil. In this country, the same glaring fact has hitherto remained officially unnoticed, though it is sufficiently notorious. While the cry is now for education, let its promoters, as well as the teachers themselves, remember that it is as much their duty to endeavor to develop the physical powers of children, as the mental ones; so that in mind and body they may be fitted to meet the storm of life. To do this, the proper means must be connected with every school.

Mr. Mann, speaking of the pupils of the Royal Orphan House at Potsdam, says—"As the boys are destined for the army, it is thought important to give them agility and vigour. It is not yet discovered that activity and energy are necessary in any occupation, save that of killing our fellow men. The boys practise gymnastic exercises, such as climbing poles, ascending ropes, flinging their bodies round and round over a bar, while they hang on only by the bend of the legs