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### Sounding the Ocean.

A correspondent of the "Literary American," Mr. Joel Ray, alluding to our remarks on the depth or the Ocean, published a short time ago, agrees generally with what we say in reference to the incompressable nature of water, but doubts our other conclusion, viz., "that the sea lead will descend to the bottom, wherever it may be—at whatever depth." He says—"we believe that after a certain limit, the forces of the under currents which run with great force and activity, might be sufficient to counterbalance the difference of the gravity in the lead *to* that of the water, and in that case the lead, instead of sinking, would either be carried on in the same stratum of the current, or else remain stationary, the line being borne out. In either case the sounder would of course be deceived."

The editor of the Literary American requests our opinion upon the above objections to our conclusions. We can easily give them.

In the first place, the sounder could not be deceived as to finding bottom; and in the second place, the power of the under-currents upon the direct descent of the sounding lead, has been greatly overrated by these who have not had much practical experience, or have not carefully investigated the subject. If the lead does not touch the bottom it will not bring up any evidence of its submarine visit on it,—hence we have always a test of the descent of the lead, by the attachment of shells, gravel, &c., on the grease that is placed in the concave bottom of the lead. The line may be deflected frem a direct perpendicular descent, so as to slightly deceive, so far as relates *exactly* to the depth, butthat is all, and then it is scarcely possible to be led astray, for according to the length of line run out, it is easy to calculate the defiection from the perpendicular, by the diagonal of the line. This answers all the objections of Mr. Ray, but to make our point still stronger, just let Mr. Ray imagine a block of wood prevented from reaching the earth on account of atmospherical under-currents, if dropped from Porter's balloon on its California voyage, seven miles above terra firma.

### Artificial Fuel.

Coal, in its natural state, consists principally of bitumen, carbon, and some earthy matters. All fuel must contain substances possessing bituminous and carbonaceous properties. Various compounds have been brought forward from time to time, some of them patented, to produce artificial fuel. All those compounds have been combinations of substances of a carbonaceous and bituminous nature, capable of generating inflammable gas and sustaining combustion. Among the first compounds with which we are acquainted, was refuse coal dust, with pitch. This was found capable of producing an intense heat. A patent was taken out in London, in 1800, by a Mr. P. Davy, for an artificial fuel, to burn without smoke or sulphurous smell. It was composed of sea coal dust mixed with charcoal, tanners' bark, and saw dust. The materials were mixed together wet, placed in a kiln and slightly cooked, care being taken not to use too high a temperature. Another artificial fuel was to place upon a shelf, above the fire, a quantity of chalk, or lime, which becoming heated from the combustion of the coal below, concentrated the heat for a long time. Another plan was to bake bituminous and anthracite coal together, to produce a very lasting coke. The proportions were one-third of the bituminous.—Another plan was that of a Mr. T. Sunderland, who took out a patent for a compound of gas, tar, clay, sawdust tanners' bark, and refuse dyewood; all were mixed together, formed into cakes, and dried by any artificial heat. Another compound, and patented too, was sawdust, spent bark, coke, cinder ashes and clay, reduced to powder, mixed, cut and dried into cakes, and then dipped into coal tar, or grease, and afterwards dried. Another compound was peat, clay, nitre, alum, linseed and resin, all ground in a mill and pressed into moulds, like bricks, and afterwards dried in the sun. Another, and an ingenious plan, to harden peat, or swamp earth, was to mix it with powdered, coal, or powdered brimstone, to break up the fibres and deprive the peat or swamp earth of its water, afterwards pressing it and making it into hard blocks. Another compound, by a Mr. Stirling, patented in England, was to mix pulverized coal with tar and clay. All were intimately mixed together, moulded into blocks and dried, and then they were excellent in shape for stowage. The great object of the producers of artificial fuel, has been to make it in such a shape that it would be easily stowed away for sea voyages, but the expense always exceeded the benefits. We might enumerate a great number of compounds of the above nature, varying but little from one another, but which constitute the subjects of no less than twenty-one patents, recorded in the London Repertory of Arts, and in the List of American Patents. We have heard very favorable accounts of using the gas tar along with spent tan bark, in the gas works, to heat the retorts, and for such a purpose the hint may be of benefit to some of our readers. A patent was taken out in Washington, last year for the compressing of coal dust into fuel, but about the most useful artificial fuel that we have heard of lately, is a kind that is made at Newton's Corners, near Albany, N. Y., by grinding swamp muck in a pug mill, then submitting it to a very severe pressure, and afterwards drying it. It is represented to burn well. In looking over the whole of the compounds that are now before us, for the purpose of making artificial fuel, we are impressed with a sense of their great inferiority to coal.

We know of no kind of fuel, taking it for all in all, that can equal the anthracite. It is compact and cleanly, good qualities certainly, but it has another, viz, great and enduring caloric qualities. Bituminous coal is good fuel, but very uncleanly for domestic use especially. One thing can make its use more agreeable, namely, to burn the smoke. This can be done by injecting fine jets of air on the top of the coals. We have recommended this before in the Scientific American, on page 332, Vol. 3, and also since that time. A patent claim, however, appears for the same principle, in our last week's number. The principle is good, and is a German invention. It is one that we again wish to direct the attention of our stove manufacturers, and all those esespecially, who burn wood and bituminous coal in furnaces. Mr. Frost, of Brooklyn, has applied it to a furnace.

### Mechanics' Institutes in England.

The report, just out, of the Lancashire and Cheshire Associated Mechanics' Institutions, in England, is not very encouraging to the friends of education for the people. Few of these institutions in the counties reported upon can be said to flourish. Most of them maintain a death struggle, of which the end cannot be doubtful—some are expiring—many are in debt, and the chief of them have expended during the year more money than they received. Nor is the moral condition better than the material. The best books which their libraries contain are not read; novels and works of amusement alone leave the shelves. A fact quoted by Mr. Hogg, the secretary, as indicative of the value of these libraries—the great number of books issued—is suggestive to us of other conclusions. The frequency of the changes denote a habit of light and superficial reading rather than one of intellectual activity. Another fact indicating decline, is the character of the lectures sought after. At first, these institutions contemplated having session lectures, thirty or forty in number, on the same subject, extending over half-a-year—as at universities. Few of the institutions now engage a lecturer for a course of more than two lectures of a series gradually unfolding a great subject, no three lectures are now given on consecutive sciences or arts. Variety, not connection of topics, is the point aimed at:—amusement, not instruction. The reasons assigned for this decline of interest in sound and useful knowledge are painful to accept. Mr. Hogg seems to think the laboring classes dead to the importance of education—the higher orders to a great extent hostile or indifferent. He is low indeed who has no wish to rise—profoundly ignorant who has no desire for knowledge. The subject is one that needs all the zeal and patience of the good.

The above facts are significant in the highest degree, of a moral deterioration in the working classes of England. When sham, straw, and fustian, are preferred to truth, healthy food and decent clothing for the mind, then may we exclaim, "they are base as self-sold slaves." We wish to *point a moral*, to our own mechanics, from the above. We do not like the name *Mechanics' Institutes*, Merchants' Institutes, or Farmers' Institutes, in this country, as embracing within their folds, peculiar classes only. Some general name, proper to the nature of the Institution, such as Scientific and Literary Association, would be better. But the main point is to give our mechanics advice in supporting such institutions. By all means, we say support them in this Republic, if you desire to stand on the summit of scientific and mechanical excellence. Those cities in England, celebrated for their works of mechanism and mechanical genius, are principally indebted to Mechanics' Institutes. Manchester and Glasgow stand highest, and the reason of this can only be attributed to the early establishment of such institutions there.

We could say a great deal more on this subject, but perhaps we have said enough. We do not find any fault with rational and sensible amusements, we only require them to be rational.

### News about Ærial Navigation.

Mr. Davidson, who recently flourished in the newspapers in connection with a correspondence with the lady of Sir John Franklin, has addressed a letter to a Mobile paper, vindicatory of himself, or rather maledictory towards the innumerable editors who have ridiculed without mercy his proposal to discover the lost navigator by means of his balloon locomotive. He consoles himself as follows:—"Science has its revenges, and sooner or later they will come upon those who ridicule the idea of practical ærial locomotion." The steamboat, the locomotive, and the magnetic telegraph, he says, have undergone and triumphed over the doubts and sneers of men lacking the genius to comprehend them, and the generosity to give them a trial.

Galileo and Columbus were the butts of this spirit of ridicule, carried to persecution, but oblivion has swallowed the shallow crowd who in all ages would have dragged down the spirit of discovery and scientific experiment, while the names of the ridiculed and persecuted men are covered with a halo of glory. The discoveries in science of modern times—within our own generation—have been such as to claim the utmost latitude for new discoveries, however novel or extraordinary. Nothing conceivable in science or invention is too great for the human mind to anticipate and accomplish.

[There is one idea here that is worthy of attention. It is the same as we have expressed ourselves more than once, and in which we agree with Mr. Davidson; it is this, "whatever the mind of man can conceive, so far as it relates to this globe, can be accomplished;" and so far as respects ærial navigation, we are not skeptics to its accomplishment, but if it be accomplished at all, it must be by some new discovery, hitherto unthought of, and very different from any now proposed, none of which at the present moment are new, or for which the projectors deserve any credit.

On Saturday the 3rd inst., Capt. J. Taggart was to make an ascent in his ærial locomotive, at Boston, but the project has been a failure complete.

### A Case of Long Fasting.

Mr. J. M. Carver, of Brownsville, Pa., informs us that his sister has fasted longer without food than Abby Hutchinson, having tasted no food for twenty-four days. She was afflicted with inflammation, and all that was administered to her, during that period, was ice and ice water. Such cases exhibit an almost miraculous kind dealing of a good Providence.

Some correspondents have sent us too long articles, and others are not careful in their penmanship. We cannot publish their letters.

### Chemistry Applied to Agriculture.

By a number of experiments, which have extended over five years, to discover the best means of preventing smut in wheat, by a commission appointed for that purpose, at Rouen, in France, it appears that the best chemical substances tried, were solutions of the sulphate of soda and lime, and the sulphate of copper. Different kinds of wheat, in various states—good, bad and middling, were all fairly tried, and the results carefully noted. The experiments were so precise that there could be no mistake about the matter. Wheat was tried without any preparation, one lot with washing in pure water before sowing; another steeped in a solution of salt; another steeped for one hour in a solution of the sulphate of copper; another in a solution of arsenic; another prepared with slacked lime; another with a solution of the sulphate of soda and lime.

The best results were from the seed wheat prepared with the solution of the sulphate of soda and lime, and this is recommended to the farmers to use. The arsenic is condemned as not being good, and on this point we agree with them. This subject is worthy of the attention of our farmers. We believe that good wheat alone should be used, and that by steeping it in a solution of common salt (muriate of soda) and then preparing it for sowing with slacked lime, the best results will be obtained. It does not appear that the French Commission tried this experiment, although it is well known to some of our farmers.

### The Velocity of Electrical Waves.

Some ingenious experiments have been performed at the Cincinnatti Observatory, in connection with the magnetic telegraph, to ascertain if there be any sensible time occupied in the transmission of the wave or current of electricity between the two points where relative longitudes are required. If there be a sensible velocity, it must involve a correction for the difference of longitude as determined by star signals passed along the waves or through the ground by electrical currents between the two observatories. Thus far, Professor Mitchell says, all results tend to the conclusion that there is no sensible wave time. Other methods may lead to a different conclusion. Experiments performed some months since, by Mr. Walker, lead that gentleman to believe he had detected and measured a wave time. The subject is interesting, and now becomes important as an element in the determination of longitudes by the magnetic telegraph.

### Railroad Racing.

There is at present a new feature in the jockey world, nothing less than locomotives are entered, and the contest is between the Central and the Rutland Railroads, Vermont. The competition extends on the one route down over the Northern, Concord, Nassau, and Lowell roads, to Boston. Over the other, down the Cheshire and Fitchburg, to Boston. The racers carry the mails only no passengers, therefore we say, "*whose's afraid?*" A short time ago John McArdle sold his great trotting horse Mac, for $3000, and it was cheap at that, but we could furnish one made of iron that could beat him four miles to one, and bump him off the course into the bargain.

### Distilation of Peat.

Dr. Anderson, an eminent chemist, publishes a statement which completely contradicts the splendid accounts that have been disseminated about the value of the *Irish Peat Bogs*. He says the whole statement, as it has been made to Parliament, is "altogether very much exaggerated," and there is no hope of peat being used for any other purpose, at present, than for that for which it has heretofore been applied.

### The Astronomical Electrical Clock.

Prof. Mitchell, of Cincinnati, claims to be the original inventor of the Astronomical Electrical Register, and a prior inventor to Dr. Lock. He publishes letters in the Cincinnati papers to prove the priority and usefulness of his invention.

We have exercised the patience of some of our excellent correspondents, but we will soon be able to clear up our regular file.

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