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Substitutes for Steam.

MESSRS. EDITORS—Although it cannot be questioned that the *Ericsson* has completely failed as a hot air ship, according to your prediction, even when the whole American press was nearly unanimous against you, and also many men distinguished for scientific information, still, I cannot but think that some other fluid may be more economical than water, for generating power by the application of heat. Although I cannot controvert your arguments in the article "Steam versus Ether," on page 237, in answer to some correspondent who seemed to speak favorably of the French steam and ether ship, still, it appears to me, that as steam contains so much *latent heat*, that ether must be more economical than water, as I find that the vapor of ether is not set down as being six times denser than steam, as you have it, and all vapors must exert the same pressure at the boiling point. Is not this so? and why may not ether or alcohol be used economically as substitutes for steam. J. R.

New York, May 20th, 1855.

[It is true, as our correspondent remarks, that the vapors of all fluids exert the same force at the boiling point, but that does not solve the question respecting the economy of using ether vapor as a substitute for steam. Prof. Apjohn viewed the question from this stand-point, and overlooked the real one, viz: the quantity of heat in a *given* volume of vapor—steam or ether. We were aware that the vapor of ether had been set down by Dr. Ure, and other authorities, as being only 4·03 times heavier than steam. In the most recent edition of Graham's Chemistry, published in our country, this question—on pages 69 and 70—is touched upon as follows:

"According to the table of M. Brix, the latent heat of the vapor of water is 972 degrees, while that of the vapor of alcohol is 385 degrees; or water has for equal weights about 2·5 times more latent heat than alcohol vapor. The specific gravity of alcohol vapor, on the other hand, is about 2·5 times greater than that of water vapor, taking the former at 1589·4, and the latter at 622; consequently equal volumes of these two vapors possess equal quantities of latent heat. If the latent heat of vapors be proportional to their volume, as these numbers seem to indicate, the same bulk of vapor will be produced from *all* liquids with the same expenditure of heat; and hence there can be no advantage in substituting any other liquid for water as a source of vapor in the steam engine."

We rely upon this authority in preference to Apjohn, or any others who have written on the subject of using ether vapor as a substitute for steam in propelling machinery.

There is no question which appears so simple to us as *latent heat*, and yet it is one respecting which certain scientific men and some professed engineers do not appear to have a proper and clear understanding. They talk and write upon the subject as if latent heat were something exceedingly mysterious, and our correspondent we must place among the number of such. A certain quantity of latent heat is just the same quantity of sensible heat, made to occupy a greater amount of space.—Steam, at atmospheric pressure, contains 1212° of heat, but exhibits only 212° sensible heat, the 1000° being called *latent*. But why call it *latent*, and why is this talked about generally in so mysterious a manner? Reduce this same steam from 1728 times its former bulk as water, to its original bulk, and what do we find? Why, it exhibits 1212° of sensible heat. Latent heat, then, is simply a certain quantity of specific heat distributed over a greater space. We certainly could not expect 1728 soldiers placed on one square acre of ground, to exhibit the same density of columns when distributed over 1728 square acres. Well, it is just the same with the heat contained in steam. The term *latent* applied to steam, like that of *negative* to the pole of an electric battery, is not exactly correct, but perhaps no other could be more appropriately used.

The accounts which have been published respectimg the steam and ether ship of Du Trembley, must be received with caution. They appear to us to be as reliable as the accounts published in our papers respecting the *Ericsson*. In studying out the difference between hot air and steam as motive agents, before the *Ericsson* made a single stroke with her paddles, we came to the conclusion, as expressed on page 133, Vol. 8, that it was not, and never could be used as an economical substitute for steam. Du Trembley appears to have the same object in view as Ericsson—saving the heat of the exhaust. In our opinion, he has made a complex engine for carrying out an erroneous idea. We may be wrong; we may have overlooked some point; but we cannot see it.—His engines consist of a combined pair, the one having its piston driven by steam, and the other by the vapor of ether generated by the exhaust steam. The ether vapor is condensed by the application of cold water outside, consequently, that heat is lost like that of a common steam engine; and this condensation must be eight times slower than by injection. What then is gained by this engine in the saving of fuel? The vaporizing force of the ether, it may be answered. True, but at what expense? The prevention of rapid condensation of the steam. So that the saving by the ether vaporization is but small, and is balanced by the loss of time in the condensation. This is the light in which we view the question; time will determine whether we are right or wrong. If Du Trembley's combined steam and ether engines effect such a saving of fuel as has been represented, and still maintain all the advantages of simple steam engines in speed and power, then they must soon supersede steam engines, for economy in fuel is the grand desideratum of the age, especially for ocean navigation.

Muntz Metal.

G. F. Muntz, Jr., has written a letter to the London *Mining Journal*, in which he claims for the metal which bears his name, (patented 1832,) a character which has of late been much disputed. He asserts that all the old yellow metal which has been brought forward as proofs of its worthlessness for ship sheathing and tubes, was spurious, and not the genuine "Muntz metal." Muntz claims alloys of copper and zinc, which are malleable at a red heat, and the proportions of these metals, to obtain this quality, range from 50 parts of pure copper to 50 parts of pure zinc, and 63 parts of pure copper and 37 of zinc with all the intermediate proportions. He admits, however, that when this alloy contains less than 60 parts of pure copper, that it is open in the texture, and easily acted upon by salt water, which soon leaves it in a porous state, by eating out the zinc. But when a larger proportion of copper is used, he asserts, that it is finer in the texture than pure copper; and when exposed to corrosion, like the sheathing of ships in salt water, the original ductility is retained to the last, like pure copper; also that it will not corrode so fast. Here, then, we have from Mr. Muntz himself, the information which will enable any person to test whether he is right or wrong; and whether the yellow metal which has been sold for genuine Muntz, and which has so signally failed, was a spurious kind or not.

Iron Floating Batteries.

During the past year, the British government has been constructing, at a vast expense, six huge floating batteries, with their outside planking of iron plates 4 inches thick, planed and fitted close together, and bolted to wooden planks, forming sides two feet thick. Each is of 1269 tuns burden, and is propelled by an engine—high pressure—of 150 horse power, driving a screw. The armament of each is one 68 pounder and two 24 howitzers. They have been built for the purpose of assailing the Russian forts with impunity, the thick wrought-iron plates being supposed to be perfectly cannon-ball proof. It is our opinion that none of these gun boats can withstand volley after volley from huge battery guns; time will soon determine this.

By the late news from Europe, we learn that one of these gun boats, just ready to be launched, was burned down in Scott Russell's ship yard, at Millwall, London. It is true the iron plates were not consumed, but all the inside woodwork was, and the iron plates became red-hot, and were thus rendered completely useless. Those which have been launched make only three knots per hour, so they may well be called "floating war lobsters."

Coal and Climates.

The great uniformity in the character of organic life over so vast an extent of the globe, during the palæzoic epoch, indicating as it does, climatic conditions of a very different character from those which now prevail, is one of the most interesting of geological science. The very small developement of the older fossiliferous rocks in the equatorial zone, is another important fact, which seems to us to indicate that the conditions for the growth of organic life in that part of the earth were unfavorable during the earlier periods of animal and vegetable existence. If the internal heat of the earth be adopted, as is done by most geologists, as the principal cause of the more uniform and elevated temperature of the globe during the earlier geological periods, is it not a legitimate inference, to conclude that the same causes which rendered the now frozen arctic zone sufficiently warm to support a prolific growth of plants and animals, must have so increased the temperature of the equatorial regions that life could not exist there except under peculiar and exceptionable circumstances. Thus the colder portions of the earth are by far the best provided with coal, and within the limits of the torrid zone there seems to be a total want of the proper coal measures.—[Silliman's Journal, May, 1855, page 382.

[If the internal heat theory—upon which the above hypothesis is based—be correct, it cannot account for the small developement of fossiliferous rocks in the equatorial zone, for these have now passed through the cooling process of those regions distinguishable for the older fossiliferous rocks. If the internal heat theory were the cause of climatic changes set forth, the same causes should have produced like effects in the gradual cooling of the earth in the equatorial as in the temporate zones. This is the legitimate conclusions we would draw from such premises. Geologists, however, are but partially acquainted with the geological characteristics of those countries lying more immediately under the equator.

The remark respecting the colder portions of the earth being better provided with coal than the countries under the torrid zone, is not exactly candid, to prove a scientific hypothesis. The fact is, the coal measures are distributed most abundantly in the temperate regions, but not according to the temperature of climates, hot or cold. New York and the extensive regions of Canada, contain but little, if any, of the coal measures, while warmer regions of the United States contain the largest coal fields of the world. In Europe, Great Britain contains the greatest amount of coal, and its climate is exceedingly mild; whereas, Denmark, Sweden, Norway, and Russia, have exceedingly cold climates, and contain but litttle or no coal. If it were the internal heat of the globe that prevented the true coal formation in the tropics, it is very singular that it should have done the same thing in the arctic regions; for Taylor says, "all the principal carboniferous formations on our planet repose *between* the arctic circle and the tropic of Cancer." There is just as much coal in the very hot as in the very cold regions of our globe, therefore the internal heat theory cannot account for such opposites.

Railroads for the South.

Owing to the great droughts which have taken place this spring in many very large districts in some of the Southern States, especially in Arkansas and Texas, it appears to us that the necessity and utility of railroads must have become very manifest to the people living in those districts. The Arkansas and a number of other rivers, have been represented as nearly dried up, and large quantities of cotton have been prevented from being sent to market in the usual way by boats; and groceries and other necessaries of life being received in return. The inhabitants of many places have thus, in consequence of these droughts, been reduced to a state of great destitution. Thus the Little Rock *Gazette* (Ark.) of the 27th of April, says, "There is not in this place a barrel of flour, a bushel of meal, or a pound of coffee or sugar, for sale. There is the greatest scarcity of every article of family groceries." The remedy for low water in rivers generally navigable, is railroads, and the people in all the Southern States should go heart and hand, with zeal and energy, into their construction. They never freeze, like our northern lakes and canals; and the iron horse cares not for high or low water. No countries are better adapted for the construction of railroads than our Southern States, and none so much require them. They possess large and fertile valleys, but the rivers which water them are directly dependent upon "the soft falling rain." They have no eternal snow-capped mountains like the Andes, to afford constant supplies of water, hence they are fluctuating, and unfitted for the purposes of constant commerce. But they may have the great modern right arm of internal commerce—the railroad—to afford them every facility, in every season, for the exchange of commerce, and they should avail themselves of its advantages.

Sanatory Substances.

As the warm weather is now at hand, it will no doubt be very useful information to many persons to be told what are the best substances for removing offensive odors from sinks, &c. Copperas, or sulphate of iron, is a very excellent substance for slushing drains and sinks. By dissolving half a pound of it in a pail of hot water, and throwing it into a sink once per week, it will keep down all offensive odor; and from the situations of many houses in all our cities, it would greatly tend to health and pleasure for the inhabitants of each to do this.—The chloride of lime, or the chloride of zinc, will answer just as well, but these are expensive substances in comparison with copperas (sulphate of iron.) Lime is also very useful, and is no doubt a cheap deodorizer, but it is not a very good one; copperas therefore is preferable to all these substances.—But there is another substance which is far superior to either copperas, the chloride of lime, or zinc, as a deodorizer, both as it respects its qualities and economy; we mean charcoal powder—made of ground wood charcoal. Charcoal powder possesses the quality of absorbing ammoniacal, sulphuretted hydrogen, and carbonic acid gases in superior degree to any other substance.—Placed in the vicinity, or spread among decaying animal or vegetable matters, it absorbs all the offensive and hurtful gases, and keeps the air sweet and wholesome.

We really hope that charcoal powder will soon come into extensive use as a deodorizer and disinfectant. It appears to us that it can be ground in mills in the timber regions where wood is cheap, transported to our cities, and sold at a very moderate price We are convinced that a plentiful use of fresh ground wood charcoal for sinks, damp floors, and the drains of cellars, would greatly tend to prevent disease in many places, by the absorption of miasma.

On the 21st ult., a case for infringing the patent of Allen, for making artificial teeth, was decided in Cincinnati, against the plaintiff.