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The Hot Air Ship Ericsson.

On Tuesday last week, this ship made her second trial trip down the Bay, and we suppose the whole country has heard of it by this time, as many of the daily papers in our city were filled next day with fulsome accounts of its *success*. The reporter's account of it in the "New York Daily Times" says "*it made ten knots an hour with ease*," and again, in another place, "it accomplished a distance of nearly twenty miles in two hours and a half," thus contradicting itself at the rate of two knots per hour. The ship in smooth water—with the tide against and with her—made an average speed of eight knots per hour. The daily papers said, "by the courtesy of those interested, the trial trip was confided mainly to the consideration of the Press of this city, and a few gentlemen whose scientific abilities render them amply qualified to pass judgment upon a subject fraught with such momentous results."

This is not true. With perhaps one or two exceptions, not one of the Press of New York invited, were competent to express a solid opinion upon the real merits or demerits of the Hot Air Marine Engine. That part of the press devoted to such subjects, some of which have been long acquainted with engineering, historically and practically, were not invited. The scientific gentlemen spoken of, with but one exception, were not qualified judges;—none of our eminent engineers were there. As we managed to be at the *select* fire annihilator experiment, we were there—AN UNINVITED GUEST. Capt. Ericsson having learned that we were aboard, on the trip, called upon us next day, and said, when all his machinery, valves, &c., were tight, and in perfect order, which he had not time yet to render so, it was his intention to invite us along with the engineering fraternity, to inspect and go on a trial trip. This explanation is perfectly satisfactory, although we cannot but think that the good opinion of one eminent practical engineer in favor of the hot air engine would be worth more than all the very extravagant language of Mr. Dana, of the "Tribune," and all the rest of the daily paper fraternity besides. No men are so willing to make allowances for extra friction and leaks in new machinery as engineers, and when it is taken into consideration that the opinion of the daily press was first solicited, not by word but deed, experienced men will take this very fact as an evidence of doubt in respect to the success of the ship.—Another thing is, the daily papers, in general, make so many incorrect statements about any new enterprise, that in our opinion, they do more harm than good to Capt. Ericsson. He is far more modest of what he has done than they are. Thus, for example, the New York Daily Times says, "it is the introduction of *a new motive power*." Now, when a merchant reads this, and goes to an experienced engineer and says, "sir, is hot air a new motive power, was it ever employed before, do you know anything about its nature and principles?" and is answered, "yes, I know of it historically, it is as old a power as the steam engine," and then shows him printed authority for its being in use thirty years ago, and also explains its nature and principles; said mercant, if he had any prejudice against the hot air ship before, would now have it confirmed instead of weakened, owing to the ignorance of the daily papers. Incorrect assertions, and indiscreet language do more injury when used in favor of a new scheme, than downwright opposition to it. Captain Ericsson does not claim to be the discoverer of "a new motive power;" he claims to be the inventor of an improved application of it; "an application and combination of machinery which has rendered it successful, and made it more safe and economical than steam." These are his claims in general terms. In 1832 he took out his first patent for a hot air engine in London, and in 1851 he took out a patent in the United States for an improvement—his engine as it is now constructed. At the present time it is not necessary for us to explain its principles; we published an engraving of it on page 60, of our last volume, taken from the patent specification, but which was not correct in one particular, it said, "after the engine is in operation the circulating medium is heated independent of combustion.". This is not so, a portion of the heat, 30°, is lost every stroke; this has to be maintained by combustion; it is not therefore pretended to be a perpetual motion. The principle of the hot air as applied, is there correctly illustrated, and by reference to it our readers will get a far better idea of its operation than in any other published description of it.

During the trip, Capt. Ericsson, by a working pasteboard model, explained the principle and construction of his engines in a very persuasive manner. They are entirely different in arrangement and dimensions from steam engines. In the engine room, instead of two close cylinders as in the steam engine, there are four large under cylinders of 22,300 square inches piston area each. These have no cylinder covers, they are only single acting, and two of them, if placed end to end, would be like the common double acting single steam cylinder. Over these lower cylinders are placed four other cylinders of 14,794 square inches piston area each. These are worked by rods attached to the pistons of the lower cylinders. These upper cylinders are huge air feed pumps, one for each working cylinder. There are no boilers; there is a chamber under each piston of the working cylinders into which the air is forced by the upper feed pumps, and is there heated, by spherical furnaces below; the expansion of the air to increase the volume and work the lower pistons is caused by the caloric or heat imparted from the furnaces. Before the engines could be started, air was forced into reservoirs above by a force pump driven by a steam engine, we believe, but which we did not see. When the air is compressed to 12 lbs. on the square inch, there is no further use of extraneous power. The heat applied in the furnace expands the air under the lower piston; it is forced up, and in so doing the upper piston forces a quantity of air into a reservoir, then when the stroke is completed, the hot air valve is opened, the air rushes out into what is termed a regenerator, and escapes into the atmosphere. This regenerator is an escape pipe or chamber, in which is placed a pile of wire gauze. This pile of minute tubes absorbs the caloric from the hot air, and when the exhaust is complete, the cold air to feed the lower cylinder is then forced through this hot wire gauze, taking up the heat as it passes through. It is this principle of saving the heat which is asserted to be the grand new discovery and improvement. This principle of saving heat is not new, but the plan of applying it is, and belongs to Capt. Ericsson. What the resistance or power expended in the regenerator is, we cannot tell. In the high-pressure engine, the exhaust steam passes at once to the air, and the cold water is fed at once to the boiler. But in those steam engines which exhaust into the water tank, and the locomotive stack represented in last week's Scientific American, we have the same principle of saving heat applied, although it cannot thus be carried out as far as in that of the hot air engine. Victor Beaumont, a gentleman who was on the trip, in an article in the "Herald," compares the action of the hot air engine, for saving the heat, to a person having a piece of sponge in his mouth; it retains the heat given out in the act of expiration, which heat is taken up by the air passing into the lungs during the act of inspiration. This is a just and very beautiful comparison, but he forgot to add, that this act increases the labor of the lungs so much, that we find it more easy in the machine of machines—the human body—to eat a little more food—expend a little more heat than to keep the sponge in the mouth to save heat by respiring through it.

Capt. Ericsson stated that only six tons of coal were used in his four single acting cylinders in twenty-four hours. This is, indeed, a very small quantity The Baltic and Pacific use 58 tons in the same time. We know that double speed involves four times the amount of fuel, but even this makes some difference in favor of the hot air engine. A correspondent of the "Brooklyn Eagle" makes out the power of the caloric engines to be only 228 horse-power, while a favorable writer in the "New York Herald" makes them to be 600 horse-power. We have nosatisfactory data to make a correct calculation. We make it to be 437 horse-power, for we take the force of heat to be 15 lbs. per square inch for every 491°, not 480° as set forth by Dalton and others. We do not give this as a correct estimate, but from data furnished, we make the united power of the engines no more, after allowing 250 horse-power for friction and other losses, this being 229 horse-power less than the favorable writer in the "Herald." One thing strikes every engineer at once, that is, the immense power expended in working the feed pumps. Out of 22,300 square inches of each piston area, no less than 14,794 inches of its pressure are expended in working each feed pump, thus leaving only 7,506 square inches of effective working surface. In marine steam engines a feed pump (single acting) for a double acting cylinder, is only 240th the capacity of the cylinder, while the feed pump of the caloric cylinder (single acting) is about two-thirds the capacity of the working cylinder. The air-pump of a marine engine is only one-eighth the capacity of the cylinder, therefore the power expended in the caloric engine upon its own self, in comparison with the steam engine is enormous. The saving said to be made is in economizing the heat, as before stated.

A very excellent dinner was given on board, and then wine and a lunch was served up. A committee was appointed to draught resolutions, expressive of the opinions of those on board. This conduct, so far as the resolutions are concerned, we do not like. It has a tendency to prostitute the independence of the press. The names of those present are solicited to sign the resolutions adopted, and after a man has eaten his host's salt, he feels a delicacy in refusing his signature to resolutions respecting him, although he does not in conscience believe in their truthfulness We could have signed all the resolutions adopted except the second and fourth. We do not believe it will supersede steam, or that it is in every respect superior to it, as stated in those resolutions. If it is superior to steam in *every respect*, it has not been so demonstrated to our satisfaction, and we cannot be convinced to the contrary against our will and reason. We know that some men look upon others as *opposed* to them when they differ in opinion respecting the feasibility and superiority of a new invention. This is evidence of a weak or unreflective mind. Opposition to a scheme does not consist in a difference of opinion as to its success and usefulness, but consists in efforts against its success. We never can have the least earthly interest in opposing any new invention, but when we cannot see into its usefulness, we must say so, or be recreant to our duty as journalists. We heartily wish success to Capt. Ericsson and his compatriots, for patriots they certainly are; the caloric ship Ericsson, is a miracle of faith and enterprise, their energy and spirit deserve success and the praise of the whole world. Neither our opposite opinions as to its ultimate success as a substitute for steam, nor the adulation of all our daily papers can make it successful or unsuccessful. If it has the real *vis insita* in it, successful it must be; if it has the *vis inertiæ* in it, fail it must. Its proprietors, it is said, are satisfied with what it has done; very well, they need not care for our opinion, or the opinion of any disinterested men, about its success or failure. After it has made a few voyages across the Atlantic, we will have some data upon which to form a correct judgment—for as yet it has not done so well as Robert Fulton's first boat, which, with its clumsy shape and bad machinery made seven miles per hour. The caloric ship has new and very excellent features about it. The designer and constructors of its machinery have shown themselves to have long heads, and skilful hands. We have never seen anything to compare with the castings. It is safe and comfortable we believe for passengers, and it saves the firemen from the pandemonium of our steamships. The caloric engine, as a saver of fuel is chiefly valuable for steamships, but if it merely saves fuel while it is sluggish in its motion, we could do that without using any fuel at all. Speed and economy of fuel must go hand in hand to command success; if these two elements cannot be combined, the latter, in this age of lightning speed, must be sacrificed to the former.

At the meeting on board the Ericsson, Prof. Mapes being called upon to make a few remarks said, "I consider there were but two epochs of science, the one marked by Newton, the other by Ericsson." The inventor to whom this unwholesome flattery was paid, rebuked the author of it with manly modesty. Some of the select representatives of the press made frothy speeches. Mr. Dana, of the "Tribune," next day used the following language: "the age of steam is closed, the age of caloric opens. Fulton and Watt belong to the past, Ericsson is the great mechanical genius of the present and future." Compared to this, the most *immoderate* flight that ever poet took when warm with wine, is *moderate*." Capt. Ericsson is a very scientific, skilful, and ingenious engineer, but he employs everything that Robert Fulton invented, and is more modest in lauding the merits of his invention, than the few un-scientific croakers who blunderingly call the invention a new motive power. As for the great Watt, he belongs to the *past*, and still rules the present, the future is still the untried; "let not him that putteth on his armor boast." A correspondent of the "Philadelphia Ledger" says, "we (Scientific American) have denounced the caloric engine as a deception." We have not; no person can point to a single sentence of denunciation, uttered by us, and as for the word "deception," we never used it. We wish the caloric ship success, and in respect to it we know what it is to feel—to wish—that our reasoning may be at fault, and our judgment swayed by our old associations and experience with steam. As it regards the saving of fuel, we will have something more to say next week.

Colt's Revolver.

We have received "The United Service Gazette," London, containing an account of the performance of Colt's revolving pistols at the Cape of Good Hope Colony. They have gained a reputation there exceeding that which they have hitherto obtained among ourselves, the native land of the inventor. Col. Colt sent out Mr. Peard as his agent to Cape Town, with a quantity of his revolvers and he invited the most celebrated shots in the British army there, to test their rifles with Colt's revolvers, at distances from 200 to 600 yards. The result of a fair trial at 200 yards distance, was, that the Rifle Corps of the army was beaten by the revolving pistol. The fame of this weapon has spread over all Southern Africa, and the recent news of the termination of the Caffre war may be in some measure due to the introduction of this weapon, for Mr. Peard sold no less than 98 revolvers in King William's Town alone. One of Colt's large holster pistols was tried in the presence of some Caffres at a mark 400 yards distant, and they declared it was "God's pistol." A correspondent from Graham's Town, writing about the performances of the revolver, states that Mr. Peard made 21 hits out of 24 shots in a target of a barrel head at 206 yards distance, and asks when Colt's revolvers are to be used exclusively in the army and navy.

New Foundry.

Messrs. Guyon, Boardman, & Co., have commenced the erection of an extensive building, intended for the manufacture of steam engines. This building is located at the foot of Eighth street, this city, on the lot of ground formerly Collins' ship yard, and will be two hundred feet front on 8th street, by 94¼ feet deep on Lewis street, and is to be three stories high. In this building will be a brass foundry, machine shop, blacksmith's shop, storage buildings, &c. Mr. Guyon, of this firm, has for many years been connected with the Morgan Iron Works, and, it is stated, has planned many of their best engines.

Mountain of Marble.

J. D. Manlove gives the "St. Louis Intelligencer" a description of a mountain of marble, which, he says, exists in the Great Salt Lake Valley. He says the marble is of almost every color and shade, in slabs of very large area, and from an inch in thickness to blocks of an immense size. Mr. Manlove judges the marble to be of the best quality, and that it is inexhaustible.