(For the Scientific American.)

Ventilation.

It is said of some of the western African tribes, that when the headsman appears, scymeter in hand, in order to fulfill the behest of his king in furnishing the annual number of victims for sacrifice, the unfortunate subject at once throws down whatever implement he may, at the moment, be engaged with, and submits, without effort for defence or escape, to his doom.

Just so it is with us upon the subject of ventilation: we make no effort to escape from the disease and death by which we are surrounded in our dwellings—in our schools—in our meeting houses—in our lecture rooms—in our rail cars, and vessels; not so much from want of apprehension of our danger as from the circumstance that, like the poor African subject, we have never been taught that we *can* escape our doom; we have never seen one who has escaped.

Hitherto every one has had his own mode, and the consequence is, that "ventilation" has become a word without meaning. Even hot-air people, who are sowing disease broadcast over the land, have of late years, since the word has become popular, called their operations "ventilating!"

What is ventilation? In my humble judgment it means comfortably living within our habitations—in all climates—at all seasons—night and day—in an atmosphere as pure as we find it outside of our dwellings—or else it means nothing.

We have all heard—our fathers and grandfathers have all talked about doors and windows, cracks and crevices, perforated plates, and glass in windows—valves at the floors and valves near the ceiling—registers in chimney-funnels—up high—down low—upward ventilation and downward ditto—hot air, cold air, and mixed—and a thousand other modes of ventilation. But is there really such a thing at this moment, in existence in any country, as a ventilated building? Can you or any of your correspondents point out one?

Ventilation is of two kinds—mechanical and spontaneous or natural. The first we have nothing to do with, because it can never be made available to the "million," and if it could it is in just as faulty a state as the other. To exemplify the subject, and make myself the more readily comprended as to what I mean by ventilation, I will select a medium with the operation of which, as it can be seen, everybody is familiar—water.

Now suppose we have a forty feet square house, built perfectly tight, as every house should be, and full of water, and a stream running into and through an aperture made in the attic, say 3×2=6 feet; and suppose we have an aperture through or on a level with the cellar floor, which will let the same quantity out, and whence it will run freely away. Now suppose this water to be air, and suppose a house could be so constructed as to keep up this flow unceasingly—this is what I should call ventilation. It is easy to perceive that whilst our house would be kept perfectly full of water, yet there would be no perceptible local current—it would gradually settle down unperceived by the inmates, and every particle of air would, in about every hour, or less, be removed entirely out of it—together with all the miasm engendered within the building during that time. If for any reason we should want the water warmed, it could be done by erecting machinery at its place of ingress, and before its distribution through the various apartments. Let us then do just so with the common atmosphere. Air has precisely the same attributes, and is subject to the same laws, and can be made to operate in the same way, as water. Like water it is a fluid—it has weight—it has inertia. Air will boil by the application of heat—it will naturally take a downward course—seeking the lowest place in regard to any body with which it may come in contact which is of less weight, bulk for bulk.

I have been led to make these general remarks upon this all-important subject, at this time, in the hope that they may assist in arresting the further progress of error, and induce a thorough investigation of the whole matter by some of your numerous scientific readers, to the end that one universal system may be discovered; and thus put at rest once and forever, the never ending suggestions of expedients which only tend to lead us further astray.

What I call ventilation is a thoroughexpulsion of every particle of old and mephitic air, and the substitution of that which is pure; and this continued and carried on in all climates—in all weathers—in every habitation of man, without doing violence to any of our senses, and with economy as regards our means.

I take it for granted that the secret, when discovered, will be found to lie in the construction of the building. There is, I am sure, a principle—a universal law, by which this great desideratum may be attained, and when once discovered and practically carried out, it will at once restore the original meaning of the word "ventilation." H. Ruttan.

Coburg, C. W., June 1, 1852.

Wave Line Theory in Ships.

Messrs. Editors—In the Scientific American of May 15, 1852, you interrogate naval architects concerning the correctness of certain extracts from a lecture recently delivered in London by Scott Russell, upon the subject of nautical architecture. In answer to the inquiry, allow me to say that the *eye* and the *model* have been the only channel through which improvements have been conveyed in the United States for the last forty years. American shipbuilders have never adopted any theory having for its basis mathematical inquiry—however near they may have approximated the theory of wave lines, in the determination of shape for their ships, it has (without a single exception) been the result of observation condensed into rotundity on the model, by the aid of the eye. The wave-line theory is regarded by ship-builders in this country as being but a partially developed system,—the merely determining the form of any line (or parallel line) of flotation does not define the shape of the vessel; and beyond this we have never learned that any arbitrary law, or tangible rule has been adopted, even by Mr. Russell himself; hollow water lines on both ends of the model have been built for thirty years in this country, and I have in my possession French drawings of vessels which have been built from, and which are from thirty to forty years old, with a large amount of hollow in the water line, both forward and aft, and but for their limited length, would rival our clipper ships of the present time: here was the great secret of success the French enjoyed in their navy history over that of the English, in point of speed, until recently. The yacht America is but an approximation to the theory of Mr. Russell; and if in her determination of shape a theory has been resolved—a problem has been solved—it is of American and not English origin. I speak advisedly when I say that her builder knew nothing of the theory of Mr. Russell when her model was made, and having investigated her peculiarities, I know that they do not conform to the theory of wave-lines as discovered by Mr. Russell. Very respectfully yours,

John W. Griffiths.

(For the Scientific American.)

Heighth of Waves at Sea, their Appearance and Effects.

Seeing an account, a few days ago, in the Journal of Commerce, about the heighth of waves, &c., it at once appeared to me the information was not derived from the proper source to be published in this enlightened age, for no person of true science would assume to know and give the depths of waves alone, without giving the terrific action and appearance of the ocean, when the tempestous blasts and billows are at their heights, the latter being far the most magnificent and interesting. Their is no class of seamen more exposed or experienced than whalemen, in rough weather and stormy seas; other classes seldom "lay-too" long enough to weather out a storm, which commonly lasts three days, in seas termed "outside of land?" The first day of the gale there is a short cutting sea with numerous white caps seen in every direction, a spray now and then dashing violently over the bows, and appearing very much like a severe storm on Lake Erie. The taking in of light sails, lowering of yards, lashing and securing boats, bolting down the hatches, &c., are characteristics of the first day. Before dawn of the second day, the large sails are all furled, and the storm sails set, which consist of two or more small sails, one at each mast close to the deck, which serve to keep the ship steady. The ship is now "laying-too," the helm is lashed, and the watch on deck takes refuge on the weather quarter. The seas now assume every variety of shape, the entire surface being covered with white foam, tossing, boiling and hissing, every sea threatening to overwhelm the ship, and frequently appearing on a level with the topmast head, and cannot be less than forty feet high. The best sea legs on board cannot now cross the deck without grasping and holding with the hands. The gale is now blowing so severe, that an old sailor told me I could not go upon the weather rigging without creeping between the flaws of winds; here was every chance for exerting strength with hands and feet. I tried, and found his statement correct. Without giving any account of the terrors or dangers of each night, or of wearing-ship, I will go to the third day, the wind continuing from one point. The seas at this time are running parallel with each other, and are much heavier and broader than the day before, being perfectly smooth, of a deep blue color, and very uniform, many of them forming one vast billow, reaching from horizon to horizon, and running at the rate of twenty miles per hour. About every eighth sea is much larger than the rest, and assumes a lofty and terrific appearance, and finally curls and breaks, actually overtaking the billow in advance, and using it as a ground floor to roll upon, leaving a white scroll of foam across the ocean far as the eye can reach, and making a noise like the roaring of distant thunder. This sight has never yet been pictured by the hand of an artist; a skiff may now ride in perfect safety on the intermediate seas, but the staunchest ship ever made, cannot get a blow from one of these breakers, without getting more or less injured. During a voyage of twenty-three months in the ship Candace, of New London, we were in several of these storms, and only on one occasion one of these seas broke square on us. We were rising out of the troughs of the sea, when the breaker, as it were, dropped down on us; the third mate gave the alarm, the top ridge was seen curling down, midway between the fore and fore-topmast yards, a distance of twenty-five feet from the deck. This sea, pressing downwards, washed the men in a wedging form, some under coils of rigging, others between the pumps and behind the spars, and some with difficulty withdrew themselves from the crevices they had been forced into. This sea broke the starboard bulwarks fore and aft, breaking fifteen white oak staun-cheons ten inches square, short off, parting the iron of the main chains, sweeping two valuable whale-boats, davits, lashings and all, by the board, and leaving us a wreck for several days. Counting the body of the ship ten feet out of water, and that it had risen five feet from the bottom of the trough, it would leave a sea of forty feet.

During the same voyage, in the Indian Ocean, we saw a large class merchantman to the leeward of us; it was not then blowing strong, but a very heavy sea was running; our captain chose to run down and speak her, she was sailing on the wind and starboard tack; when getting on a line with her course we luffed on the larboard tack, which left her on our starboard one point, and about 600 yards distant. Both ships were now nearing each other, and both settled down in the trough of the sea simultaneously; the merchantman, evidently alarmed at our near approach, ran off two points, this caused her to follow nearly in a line of the trough of the sea, and her entire masts were entirely out of sight at least twenty seconds. Both ships came up side by side, one sea distant, and spoke each other. The merchantman was full rigged, having royal masts and sails set; her mast, from the top of main royal, was judged by the officers and crew to be ninety feet to the main deck, her body out of water ten feet, her masts inclined 45 degrees, would leave a sea of fifty feet; this caused much wonder, even to the old sailors, it being a sight seldom seen, and was witnessed by the whole crew of 34 men, at the dog watch, at 6 o'clock in the afternoon; this sight cannot be witnessed only on like occasions. C. R. M. Wall.

A Wonderful Man.

Richard Arkwright, it would seem, was not a beautiful man,—no romance hero with haughty eyes, Apollo lip, and gesture like the herald Mercury; a plain, almost gross, bag-cheeked, pot-bellied Lancashire man, with an air of painful reflection, yet also of copious free digestion; a man stationed by the community to shave certain dusty beards in the northern part of England, at a half-penny each. To such end, we say, by forethought, oversight, accident, and arrangement, had Richard Arkwright been, by the community of England and his own consent, set apart. Nevertheless, in strapping of razors, in lathering of dusty beards, and the contradictions and confusions attendant thereon, the man had notions in that rough head of his; spindles, shuttles, and wheels plying ideally within the same, rather hopeless looking, which, however, he did at last bring to bear. Not without difficulty! His townsfolks rose in mob round him, for threatening to shorten labor,—to shorten wages, so that he had to fly, with broken wash-pots, scattered household, and seek refuge elsewhere. Nay, his wife too, as I learn, rebelled; burned his wooden model of his spinning-wheel, resolute that he should stick to his razor rather,—for which, however, he decisively, as thou wilt rejoice to understand, packed her out of doors. O reader! what a historical phenomenon is that bag-cheeked, pot-bellied, much-enduring, much-inventing barber! French Revolutions were a-brewing; to resist the same in any measure, imperial Kaisers were impotent without the cotton and cloth of England; and it was this man that had to give England the power of cotton.—[Carlyle.

[And this is the man who, according to the opinion of the "New York Daily Times," could not be *a true man*, because he took out a patent, and did not look to *the gratitude* of his fellow man, as satisfactory remuneration. It is to him we are indebted for our cotton manufactures, which the said paper wants protected by a patent tariff, not to the men who invented or introduced them, but who merely conduct the business. Samuel Slater, who introduced the cotton manufacture by machinery into our country, learned his trade in Arkwright's mill, in Derbyshire, England. Those men who opposed Arkwright were furious against patents, ignorantly, no doubt, but still furious like many in our own day. They would have tied Arkwright to his razors and soap brush, rather than have given him a patent. There is no general gratitude in the hearts of men to such benefactors of our race as inventors, but Richard Arkwright lived to be the richest commoner in England; he had his reward, and was greatly assisted in attaining it, by such men as the grandfather of our Robert Dale Owen, viz., David Dale, of Glasgow, a benevolent and christian manufacturer, who encouraged and cheered Arkwright by his respect for his patent rights.

American Corn in Jerusalem.

The Sabbath Recorder, speaking of Indian corn in Palestine, relates the following story:

A traveller in 1849 felt a strong impression to take a beautiful twelve rowed ear of Indian corn, that was presented to him by a friend, from the country; and he put it into his trunk, intending to drop some of its grains in some opportune spot. When they arrived at Meshullman's hotel in Jerusalem, and after he had told them of his efforts in agriculculture, and found that the friends were Americans, he said, one day:—"In 1825 I travelled in the United States, and visited Philadelphia in the summer; and at dinner had a mess of sweet green-corn—what was called *hot corn* by the servants. Since I have turned my attention to planting, O, how often I have wished for one such ear of corn to plant in my fatherland." The friend listened, and as he said this, impulsively went to a trunk, fumbled hastily to the bottom, and produced his ear of corn, exclaiming: "Now I know why I had to bring this ear of corn with me; take it, for it must be for you;" and related his impression of mind. Meshullman thanked God aloud before them and said: "Yes, surely it was the heavenly Spirit from God that put it into your heart to bring it so far; for none but He knew how greatly and often I had desired to obtain some. I never saw so large a one as this."