(For the Scientific American.)

Railways, Steamships, and Telegraphs.

RAILWAYS—I have seen on page 291, this volume of the Scientific American, that there are some hopes of improvement on our railways which will make them less destructive of life and property. Permit me to recall a proposition made in the very beginning of the system by Mr. Morgan, an able but too modest a man for the times we live in; this engineer was one of the first employed in Massachusetts and New York. He proposed to have timber between the two rails, about eighteen inches high, against which horizontal wheels should run freely, touching occasionally; the car wheels were to be without flanches, thus saving much friction; such wheels might be used on the present tracks. Perhaps more has been written on this subject than I have seen; I merely call it up for re-examination, if it has not been absolutely exploded. Corporations must do something for their own interest, and they will look to your valuable paper as the focus of mechanical intelligence; it would be well therefore, at this time, that speculation—good, bad, or indifferent, should bring forward their notions; a fool's hint may be made useful by a wise man.

SEA STEAMERS—I have seen also in your valuable paper, that a monstrous large steamer is about to be built in England, with four side wheels and a screw propeller. Here I beg leave to remind you that I had the honor to propose in your paper some time ago to construct all our long steamers with four wheels, and referred to the advantage of wagons over carts by way of illustration. The four wheels to a steamer will have some advantages over the wagon, for this will perform Fulton's desideratum, they will raise the vessel out of the water—that resting medium which offers more resistance exactly in proportion to the increase of speed; which proposition was thrown in the teeth of Fulton by the French philosophers when he told them that he could make a ship exceed fourteen knots an hour.

TELEGRAPHS AND STEAMERS—It will be long before we get a telegraph across the Atlantic; but a combination of the two systems extend your telegraph as far East as possible, through Nova Scotia or Labrador, then cross from Newfoundland, or Labrador to Ireland by a steamer of iron expressly built for the postal service, and so strong, as to fear no storms or waves, very long compared with her width and depth, and with as much power as can be put into her, wheels and propellers. I am convinced that you will find in New York, builders and engineers who will produce a post packet which will fly over the water like a flying-fish—merely touch-and-go. This was indeed the philosophy of Fulton, practiced in a minor degree, for the double purpose of speed and freight; but we are willing to sacrifice freight and even passengers' fees—all for speed. I should prefer, as a passenger, this mode of flying from wave to wave, to flying over the clouds.

The passage over the water would be so short that little coal would be consumed.

Boston, June, 1853.

[If such a line could be supported, we would heartily agitate the subject. There is nothing impractical in it; it is only a question of pay or not pay. A steamship running at an average speed of fifteen miles per hour, could run from Newfoundland to the West coast of Ireland in 5 days 13 hours, allowing the distance to be 2,000 miles, which is not far from the mark, This project will no doubt be carried out at some future period.—ED.

Preserving Strawberries.

As this is the season of the year when this delicious fruit is so plenty, a few directions about their preservation for their future use, will not be out of place.

STRAWBERRY WINE.—Bruise the fruit and press out the juice; then pour over several gallons of water, infuse for twelve hours, and press out the liquor; add this liquor to the juice, and mix with some gallons of cider; dissolve in the mixture sufficient sugar and three ounces powdered red tartar, and then set it to ferment in the usual way; pare the rinds of two lemons and two oranges, and, together with the juice, throw them into the fermenting tub, and take out the rinds when the fermentation is over; some brandy may be added.

STRAWBERRY JAM.—Weigh equal proportions of fine sugar and strawberries; put the fruit into a preserving pan, and bruise and mash it well with a spoon or stick, let it boil up, then add the sugar, stirring it well with the fruit; let it boil ten minutes, skimming it perfectly clear.

The Irish poet who compared the lips of his fair one to "a dish of fresh strawberries smothered in cream," possessed a very *fine taste.*

[For the Scientific American.]

Curious Properties of the Figure 9.

PROPOSITION 1.—Take a number containing two figures, say 83, reverse the figures, which will make 38, then subtract them from the original number, 83, and the difference will be 45—nine times the difference between the two figures 8 and 3, which is 5. Example:

83
38

$45=9\times(8-3)=5$

The following formula shows the fact and reason, taking the value of x equal to 8, y equal to 5, and z equal to 3: $(10x+z)-(10z+x)=9(x-z)$.

2nd.—Take a number containing three figures reverse and subtract as above, and the difference will be equal to 99 times the difference of the first and last figures. Example:

853
358

$495=99\times(8-3)=99\times5$

Formula $(100x+10y+z)-(100z+10y+x)=99(x-z)$

3rd.—But if, instead of reversing the three figures as in the second proposition, you place the centre one first, and the last in the centre, then the difference will be 9 times 11 times the first figure less the two last. Example:

853
538

$315=9+(11\times8-53)=9\times(88-53)$

Formula: $(100x+10y+z)-(100y+10z+x)=9(11x-(10+z))$

[illegible] number containing two figures, from which subtract 9 times the first figure, and the difference will be equal to the sum or amount of the two figures added together. Example:

83 added together make 11
72, nine times first figure, 8, subtract

11

Formula: $10x+z-9x=x+z$.

5th—Reverse this, and from the two figures take their sum or amount added together, and you will have 9 times the first figure. Ex.:

53
8, the sum of 5 and 3

45, 9 times the first figure, 5

Formula—$10y+z-(y+z)=9y$.

A curious result is obtained on the principle of Prop. 5: take, for example, a number containing two figures (a number containing any amount of figures will do as well) say 86 separate each figure into two others containing together the same number of digits, say 5 and 3 for the 8, and 4 and 2 for the six, then you will have 5342; now you may change their places so as to destroy the connection of the 5 and 3 and the 4 and 2; for example, place the 3 first, then the 2, then the 5, and lastly the 4 (or any other way you may desire) then you have 3254; now take the original figures from any part of the number, and you will invariably find the difference to be a multiple of 9. Example:

3254		3254		3425
8 6	or	68	or	6 8
9÷2448		2574		2817
272				

If, after this is done, a number is left out of the difference, it can be detected without knowing the figures used in the calculation; for example, if a 4 is left out of the first of the above three examples, you will have 248, which, divided by 9 (or added up until you have only one figure, as 2 plus 4 plus 8 make 14, and 1 plus 4 make 5) will have 5, and you see immediately that there is a 4 wanting to make up the 9. JAMES SWAIM.

Philadelphia, Pa., 1853.

(For the Scientific American.)

Heat—Expansion and Contraction.

A great deal has been said about the different rates of expansion of different bodies, but the rates of contraction seem to have been rather overlooked. Now to obtain a motive power by the means of heat, contraction and expansion are equally necessary. To double the volume of a body is only one half of the work, and to bring it back to its original condition, constitutes the other half. Different bodies are held together by different rates of cohesive power, and in expanding we work against the cohesive power, and in contracting we work with it.

Let x=amount of cohesive power.
Let a=a certain amount of heat.
Then $a-x$=the expansive power.
$a+x$=the contractive power.
And $a-x+a+x$=whole amount of heat used.

It will readily be perceived that whatever may be the value of x the whole amount of heat used will always equal $2a$. This may be further exemplified in the case of the piston of a steam engine with an upright cylinder. If an extra amount of power is required to overcome the weight of the piston in the upward stroke, just so much the less power is required to bring it down again, so that nothing is lost or gained by the weight of the piston. It follows then that whether we apply the heat to air, water, carbonic acid gas, hydrogen, mercury, or any other substance, the result will be the same. A pound of coal contains a certain definite amount of heat, just as it has a certain definite weight, and it is an error to suppose that by artificial means we can increase either. C.

Paterson, N. J.

Annual Depreciation of Locomotives.

LOWELL, MASS., May 30th, 1853.

To the Editor of the Scientific American:

I noticed in a late number of your paper, you have made an allusion to a statement made by me in the "Railway Times," wherein I say that "an engine destroys itself at the rate of $10 per day, when in full use." I will give you the evidence upon which the statement is made.

"The first cost of the New York and Erie engines is from $7,500 to $10,500, (not from $3,500 to $7,500 as given by you.) The average cost is $9,000 instead of $5,000. The Erie engines run 2,389,271 miles, by the report for the official year of 1852, and the expense of engine repairs was $203,312 48, or eight and a-half cents per mile run. Now by the time an engine has been in full use for twelve years, its first cost and renewals have so depreciated from wear and age, that its sale would not realize half its original cost when new. The first cost being $9,000, and the repairs having amounted to $25,500 (for 300,000 miles run at 8 1-2 cents per mile) gives $30,000, as the total depreciation of the engine, or $10 per day for 100 miles daily trip.

The expense for repairs, as cited by me at five cents per mile, refers to the engines on the Baltimore and Ohio Railway, where with the use of the patent chilled slip tire for drivers, they are enabled to save $30,000 yearly in repairs, above what would attend the use of wrought iron tires.

You show the depreciation of the Erie engines, by my statement, to be $426,000 yearly. The valuation of the Erie engines up to the last report, was $1,349,987 29, not allowing for any depreciation. If we allow 8 per cent. for annual depreciation, we have $107,998 98, which added to $203,312 48, the expense for repairs for one year, gives $311,311 46 for the total annual self-destruction of motive power. Were all the engines of the first class dimensions, and in 'full use,' this amount would be increased far beyond your highest estimate of $426,000.

As I have furnished you with these facts in detail, I trust you will not consider this an extraordinary statement. ZERAH COLBURN.

[The above is from the "American Railway Times" of June 2nd, to which Mr. Colburn is a regular and valuable contributor.

Change in Locomotive Fuel.

A number of experiments have recently been made on the Baltimore and Ohio Railroad by the superintendant for the purpose of testing the economy of coke as a fuel in comparison with wood, which has heretofore been used exclusively. The coke made was from the Cumberland bituminous coal, and the result, we understand, has been so satisfactory that it is intended hereafter to dispense entirely with the wood. The saving of expense has been stated to be about 25 per cent.

About two years ago the Hudson River Railroad Co. bought a quantity of coke for the purpose of testing its merits comparatively with wood. We never heard the result. The time is not far distant when all our railroads will be compelled to stop using wood for locomotive fuel, and the sooner they set about preparing for the change so much the better. It will be a good thing for passengers when wood ceases to be used; the *spark punishment* now inflicted on travellers will then be abolished. As no wood is employed on the English railways, we cannot see how it is that the same fuel used there cannot be used here with equal advantages; the coke from the Cumberland coal may bring about the desired relief.

Salmon Fisheries in California.

The "Sacramento Union" presents some information respecting the salmon fisheries on the Sacramento river, which far transcend all the ideas we ever had of the abundance of such fine fish in any part of the world. It says:—

"The water of the river must be alive with salmon, or such quantities caught daily would sensibly reduce their numbers. But experienced fishermen inform us, while the run lasts, so countless is the number, that no matter how many are employed in the business, or how many are taken daily, no diminution can be perceived. They seem to run in immense schools, with some weeks intervening between the appearance of each school, during which the numbers taken are light, as compared with the quantity taken during a time like the present. No account is kept of the number engaged in fishing, or of the amount caught, and all statements relative thereto are made from estimates obtained from those who have experience in the business, and probably approximate correctness.

These estimates give the number of men employed now in taking fish in the Sacramento at about 600; the number of fish taken daily do an average, 2,000; their average weight seventeen pounds. It requires two men to man a boat, which would give 300 boats for 600 men; 2,000 fish a day would give to each man a fraction over three as his share. Large numbers are saltod down daily, several firms and individuals being extensively engaged in this branch of the trade. The fish are put down in hogsheads, which average, when filled, about 800 lbs.

The salmon fish is found in no other waters in such vast multitudes as are met in rivers emptying into the Pacific. On the Atlantic side the leading fish feature is the run of shad in the spring; on the Pacific side, salmon ascend our river at all seasons, in numbers beyond all computation. In California and Oregon our rivers are alive with them, the great number taken by fishermen are but a drop from the bucket. Above this, on the coast side, tribes of Indians use no other food. As a table luxury they are esteemed by most persons the finest fish caught. Unlike many fish they contain but few bones, and the orange colored meat can be served in slices to suit customers. It is emphatically the meat for the million; it costs so little—not a quarter that of other meats—that rich and poor can feast upon salmon as often in the day as they choose to indulge in the luxury. In the course of a few years salmon fishing will extend itself to all the prominent rivers in the State. Catching and curing salmon will then have become a systematized business, the fish consumption will then have extended itself generally over the State, and more than likely become in the meantime an important article of export."

The North Star arrived at Southampton on June 1st, after a passage of 11 days. This was good, but not extraordinary, as she carried no cargo and was in good sailing trim.