caboose to Port Jervis. For this they were paid at the rate of one day. Consequently, where it formerly took thirty engines to haul six hundred cars over the road, it now only requires fifteen, assisted by the pushers stationed at the various points. Dividing the sixteen additional "pusher" gangs, or forty-eight men, by seven, the number comprising an ordinary freight gang, gives about seven full gangs, which, added to the fifteen saved in the number of trains, makes twenty-two, leaving a clear saving to the company of eight gangs of men and eight locomotives in hauling six hundred cars from Port Jervis to Jersey City. In handling the traffic of the Erie, which ranges from twelve hundred to two thousand cars daily, the cost is correspondingly decreased as regards the pushers, as the same number is used for the greater traffic as for the less. In handling twelve hundred cars, sixteen gangs are dispensed with, and eighteen hundred, twenty-four gangs. The time consumed in running between these points is not much lengthened. The experience thus gained resulted in the ordering of ten more of these monster locomotives, which have just been placed upon the road.

Keeping the Boys on the Farm.

In an extended argument as to the desirability of farmers' sons sticking to the farm, the Cincinnati *Commercial* observes that there is a feature in this matter of sons following the calling of their fathers that is not sufficiently regarded.

"The calling of the father may rise to a higher dignity when the sons adopt the business, thoroughly learn it, and zealously and proudly pursue it. Then the accumulated reputation, capital, and business of the parent can be inherited and preserved by the sons.

"Again, it is a law of nature that holds good in all the animal kingdom, that aptness for any business may be inherited, or may be bred, as we say of stock. The great desideratum in developing a race of trotters is to insure an aptness to trot. And this comes not from stock that has habitually been used for the draught or chase or race course. If the dam trots and the sire trots we do not expect the offspring to be a running horse.

"The old Spartans understood this law of developing an aptness for a given calling in the children. The Germans of olden times developed a race of warriors on the same principle.

"The law of heredity is so broad and so powerful in its influence that it extends not only to color and form of our race, but it extends to the temperament and even to the tastes. The taste, though like the muscle and reasoning faculties, may be improved by education. Still the taste for and aptness for any calling may be increased from generation to generation.

"Then, if we are to reach the highest development as a race of farmers, we must expect it through the line of descent. The son must inherit the fitness of the father, and take up the calling and business where he left off, and his son after him, and so on. When this shall become the custom in our farming families, then shall we see greater stability in society and a higher type of civilization. Every parent has the chief power to bring this work about. The very independence of the farmer's life is to be the germ which develops a race that can not be other than an independent people. Our nation is to achieve its greatness in the development of agriculture. Its power at home and abroad is to be established and held through the arts of husbandry, practiced by a skillful and virtuous race of farmers. All then that can be done by the state or family to ennoble and to dignify the calling, and to entail its blessings and influence from father to son, will add to the stability and grandeur of the nation."

Rainfall and Forests.

Some interesting observations have lately been made touching the influence of forests on rainfall, at the School of Forestry, Nancy, France. The results of these observations, made during the past six years, are summed up by the sub-director of the school as follows:

1 Forests increase the quantity of meteoric waters which fall on the ground, and thus favor the growth of springs and of underground waters. 2. In a forest region the ground receives as much and more water under cover of the trees than the uncovered ground of regions with little or no wood. 3. The cover of the trees of a forest diminishes to a large degree the evaporation of the water received by the ground, and thus contributes to the maintenance of the moisture of the latter and to the regularity of the flow of water sources. 4. The temperature in a forest is much less unequal than in the open, although, on the whole, it may be a little lower; but the minima are there constantly higher, and the maxima lower, than in regions not covered with wood.

These results substantially corroborate those made by M. Fautrait, when sub-inspector of the forests at Senlis, France, and given as follows:

1. It rains more abundantly, under identical circumstances, over forest than over non-wooded ground, and most abundantly over forests with trees in a green condition. 2. The degree of saturation of the air by moisture is greater above forests than over non-wooded ground, and much greater over masses of *Pinus sylvestris* than over masses of leaved species. 3. The leafage and branches of leafed trees intercept one third, and those of resinous trees the half of the rain water, which afterward returns to the atmosphere by evaporation. On the other hand, these same leaves and branches restrain the evaporation of the water which reaches the ground, and that evaporation is nearly four times less under a mass of leafed forest than in the open, and two and one third times only under a mass of pines. 4. The laws of the change of temperature out of and under wood are similar to those which result from the observations of M. Mathieu. The general conclusions seem to be that forests regulate the function of water, and exercise on the temperature, as on the atmosphere, an effect of "ponderation" and equilibrium.

ATTRACTION.

In looking over the early volumes of the SCIENTIFIC AMERICAN, a few days ago, the memories of the past were vividly brought to mind by reading the following poetry, which appeared in the first column of the first issue of this paper, dated August 28, 1845. We wondered as we read this how many of our present patrons remember reading the effusion when it first appeared:

Attraction is a curious power,
  Thatnone can understand:
Its influence is everywhere—
  In water, air, and land;
It keeps the earth compact and tight,
  As though strong bolts were through it:
And, what is more mysterious yet,
  It binds us mortals to it.

You throw a stone up in the air,
  And down it comes—ker-whack;
The centrifugal casts it up—
  The centripetal—back.
My eyes! I can't discover how
  One object 'tracts another;
Unless they love each other, like
  A sister and a brother.

I know the compass always points
  Directly to the pole:
Some say the North Star causes this,
  And some say—*Symms's Hole!*
Perhaps it does—perhaps it don't;
  Perhaps some other cause;
Keep on *perhapsing*—who can solve
  Attraction's hidden laws?

A fly lights on a 'lasses cup—
  Attraction bids him woo it;
And when he's in, attraction keeps
  The chap from paddling through it.
Attraction 'lures the sot to drink,
  To all his troubles drown;
But when his legs give way, he falls,
  And 'traction keeps him down.

Attraction is a curious power,
  That none can understand:
Its influence is everywhere—
  In water, air, and land.
It operates on everything—
  The sea, the tides, the weather;
And sometimes draws the sexes up,
  And binds them fast together.

Do It Well.

Whatever you do, do it well. A job slighted, because it is apparently unimportant, leads to habitual neglect, so that men degenerate, insensibly, into bad workmen.

"That is a good rough job," said a foreman in our hearing, recently, and he meant that it was a piece of work not elegant in itself, but strongly made and well put together.

Training the hand and eye to do work well leads individuals to form correct habits in other respects, and a good workman is, in most cases, a good citizen. No one need hope to rise above his present situation who suffers small things to pass by unimproved, or who neglects, metaphorically speaking, to pick up a cent because it is not a dollar.

Some of the wisest law-makers, the best statesmen, the most gifted artists, the most merciful judges, the most ingenious mechanics, rose from the great mass.

A rival of a certain lawyer sought to humiliate him publicly by saying: "You blacked my father's boots once." "Yes," replied the lawyer, unabashed, "and I did it well." And because of his habit of doing even mean things well, he rose to greater.

Take heart, all who toil! all youths in humble situations, all in adverse circumstances, and those who labor unappreciated. If it be but to drive the plow, strive to do it well; if it be but to wax thread, wax it well; if only to cut bolts, make good ones; or to blow the bellows, keep the iron hot. It is attention to business that lifts the feet higher up on the ladder.

Says the good Book: "Seest thou a man diligent in his business, he shall stand before kings; he shall not stand before mean men."

The Western Union Telegraph.

The annual report of the President of the Western Union Telegraph, for the year ending June 30, 1879, contains a statement showing the mileage of lines and wires, the number of offices, and the traffic of the company for each of the past fourteen years. In 1866 the company owned 37,380 miles of line with 75,680 miles of wire, and had 2,250 offices. The number of messages sent is not given, but would appear to have been about 5,000,000. The increase in traffic year by year has been much more rapid than in the amount of wire or the number of offices. Last year the company had 82,978 miles of line, 211,566 miles of wire, 8,534 offices, and sent upward of 25,000,000 messages, on which the charges were nearly $11,000,000, and the profits $4,800,000 The capital stock of the company is, in round numbers, $41,000,000.

Effects of Atropine and Pilocarpine.

Some interesting experiments on the local antagonism of atropine and pilocarpine were recently communicated to the Académie des Sciences by M. Strauss. If one or two centigrammes of nitrate of pilocarpine are injected beneath the skin of a man, at the end of from two to five minutes the skin covering the injected liquid reddens, and then is covered with very fine droplets of sweat, which appear first not at the point of the injection, but at the circumference of the area, and extend concentrically to the center, finally covering the whole area. This local sweat occurs two or three minutes before the salivation, and five or eight minutes before the general perspiration, and it is the more pronounced the greater is the number of sudiparous glands at the spot; the best places being the forehead or front of the sternum; the back of the arm, where injections are most frequently made, being the least favorable, and for this reason probably the phenomenon has escaped observation. Reducing the dose, the effect of the injection becomes ultimately strictly local, without the slightest general sweating. Thus, at will, this or that part of the skin may be made to sweat, or lines of sweat may be produced on an otherwise dry skin. The dose with which the effect is purely local is from one to four milligrammes.

By means of subcutaneous injections of atropine the opposite effect may be obtained. If, when a person is in full sweat from the effect of pilocarpine, very minute does of sulphate of atropine are injected under the skin, the perspiration lessens at the spot almost immediately, and in a few minutes it is totally suppressed. Thus dry areas and lines may be at will produced upon the moist skin. In order to ascertain that the arrest of the perspiration is really the result of the atropine, and not of the mere injection of liquid, an equivalent volume of pure water was injected at certain spots, but without causing any arrest of the perspiration. The dose of atropine which will arrest the sweating is extremely small. One-millionth of a gramme of atropine never failed to produce it in man, and in the cat one-hundred-thousandth of a gramme was sufficient. The sweating skin is thus a test of atropine of extreme delicacy. The sensibility of the sudiparous glands to atropine is greater even than the iris, since the millionth of a gramme of atropine produces no appreciable dilatation of the pupil.

Treatment of the Hair.

How to preserve the hair is a subject which seems to interest almost everybody, if we may judge from the frequent inquiries from every direction which come to this office. One wishes to know what will prevent baldness, another how to preserve their hair from turning gray, another how to eradicate dandruff, etc. Now it is a delicate matter to recommend any special treatment, but Professor Wilson, of England, who is deemed high authority on the hair, condemns washing it, and advises, instead, thorough brushing. This promotes circulation, removes scurf, and is in all respects, he says, better than water.

Cutting the hair does not, as commonly thought, promote its growth. Most of the specifics recommended for baldness, not excepting petroleum, are mere stimulants, and are seldom or never permanently successful. Some of them give rise to congestion of the scalp. When a stimulant is desirable, ammonia is the best. It is safe.

For falling out of the hair, Dr. Wilson prescribes a lotion composed of water of ammonia, almond oil, and chloroform, one part each, diluted with five parts alcohol, or spirits of rosemary, the whole made fragrant with a drachm of oil of lemon. Dab it on the skin, after thorough friction with the hair brush. It may be used sparingly or abundantly, daily or otherwise.

For a cooling lotion, one made of two drachms of borax and glycerine to eight ounces of distilled water is effective, allaying dryness, subduing irritability, and removing dandruff.

Both baldness and grayness depend on defective powers of the scalp skin, and are to be treated alike. What is needed is moderate stimulation, without any irritation. The following is good: Rub into the bare places daily, or even twice a day, a liniment of camphor, ammonia, chloroform, and aconite, equal parts each. The friction should be very gentle.

High Wind Velocities.

In its review of the hurricane which swept along our Southern Atlantic seaboard, August 18, the Weather Bureau reports that the wind velocities, noted as the central vortex neared Cape Lookout, were among the highest, if not the highest, which have ever been recorded. At Cape Lookout, at 6:30 A.M., of the 18th, the barometer falling very rapidly, the cups of the anemometer were blown away while the instrument was registering a wind velocity of 138 miles per hour. But this was not the maximum. An hour and a half later, as the storm center began to pass away, and the barometer to rise, the wind rose to the estimated velocity of 165 miles per hour. An observed velocity of 100 miles an hour was also reported from Cape Henry. The highest winds attending storms near sea level, with which these can be compared, are perhaps those of the Liverpool storm of February, 1868—from 100 to 120 miles an hour—and those of the great Guadeloupe hurricane of 1865, from 100 to 130 miles.

THE St. Gothard Tunnel, which will measure 14,920 meters when completed, has now reached a length of 13,229 meters. It is hoped that by the beginning of December the gigantic work will be finished.