The Democratic Tendencies of Science.

The *College Review* for January contains a paper read by Prof. Olmstead, of Yale College, on the above-named subject, before the American Association for the Advancement of Education. We like the spirit that pervades the entire article, and are happy to see that its distinguished author agrees with us in those views respecting the elevating tendencies of science and invention which have been presented on various occasions through these columns.

In an article on page 253, Vol. 6, SCIENTIFIC AMERICAN, entitled "Knowledge is Democratic," we used the following language: "We talk of this and that influence levelling the mass of men upwards, but the great elevator and democratic reformer, is knowledge." On page 325, same volume, is an article entitled "The Recognition of Genius and the Industrial Principle," we used the following language:—"Men are now becoming something for what they have done and for what they can do, not for what their fathers were. The aristocratic principle is the *past* principle, the industrial is the *present*. The Great Exhibition in London, although devised by a Prince, in the broad democracy of its management, is a recognition of the aristocracy of genius and the industrial principle." The experience and observation of Prof. Olmstead corroborate the correctness of these views. He says, "The inventions of science tend to elevate the masses and to produce social equality. Such, I aver, has been the actual effect of the changes which the inventions of science have brought about in our own country within the last fifty years,—a period distinctly within my own recollection. These changes have been chiefly effected in the following way: first, by *improvements* in the arts of *locomotion*; secondly, by the general *diffusion of intelligence*, especially through the medium of newspapers; thirdly, by an extraordinary multiplication and cheapness of the conveniencies and elegancies of life." These premises the Professor elaborates in a clear and graphic manner. Of Connecticut, the field to which his observations were mostly confined, he says:—

"Before the introduction of steamboats and railroads, there were great distinctions maintained between the professional and industrial classes, and between men of wealth and what are called 'the common people,' especially in their modes of traveling. The gentlemen in coaches were looked up to as a superior class of people, with whom those in wagons or on horseback could not presume to claim any acquaintance, or to have any, except the most formal intercourse, and those in coaches claimed the principle of caste, &c.

This anti-republican distinction is nearly obliterated in our State, and the separation is not now into the upper and lower classes, but into the virtuous and vicious—the industrious and the indolent. If we enter a railroad car we meet with people of different vocations, but we recognize no appearance of caste."

After presenting this idea more fully, he says, "the facts which have been adduced are sufficient to show that something has, within the last half century, greatly extended the privileges and enjoyments of the masses of our countrymen, and produced a far greater equality in the social condition of the laboring in comparison with the wealthy classes, and vastly augmented the intelligence and respectability of the country."

He then asks the question, "Has science produced these results?" and answers, "I do say that these happy changes have been the true and legitimate results of science."

Speaking of great inventors, however, we think Prof. Olmstead holds up those who were college-bred scientific men too exclusively, by not saying enough respecting those who have done so much to advance science and art, and who labored under the disadvantages of a very limited education. Thus he speaks warmly of Eli Whitney and Morse as "Sons of Yale," and then describes the benefits conferred upon cotton and linen manufactures, by the discovery of bleaching, but merely says, "This immense improvement in the art of bleaching was a present which chemistry made to the arts." And who made this discovery in chemistry, let us ask? Scheele, a French chemist. He discovered that chlorine could bleach vegetable productions with great rapidity; but so can ozone, and why is it not generally used? Simply because an inventor has not yet arisen to do for ozone what Charles Tennant, a working mechanic, did for chlorine gas, viz., make it available and economical for common use.

But Prof. Olmstead, we believe, would not wilfully depress the merits of one inventor to exalt those of another, whether educated in a college or at a counter. His heart is right on this great question, "the democratic tendencies of science!' Such sentiments as he has expressed, coming as they do from "Yale," fill us with unaffected pleasure.

Locomotive Telegraph.

We have already noticed in former numbers of the SCIENTIFIC AMERICAN, that M. Boneli, of Turin, Italy, had invented a method of telegraphing in a railroad train running at any speed. His first experiments were tried on a locomotive running on a line of railroad in Sardinia, and were stated to be very successful. He has recently made some experiments in France, especially one on the St. Cloud and Paris Railroad. Instead of the ordinary telegraphic wires, he placed a thin half-inch iron band or ribbon along the center of the track, between the two rails, and pinned it to insulators about two inches above the ground. The telegraph apparatus was placed in the locomotive, and by touching a key, a metal spring was brought into contact with the band or conductor along the track, and thus closed and broke the circuit with the battery, thereby writing messages in the locomotive while running as easily as could be done in a house.

The experiments were performed in presence of the French minister of public works, and a large number of scientific gentlemen, amongst them several Americans. A train was first sent on in advance, presently followed by a second, which latter stopped and commenced an interchange of signals with the first train, still in motion. The signals were made and replied to with equal facility, as under the ordinary conditions between station and station. Bye and bye, the first train despatched orders to the second to follow it and in this postion, both trains proceeded at full speed, a constant exchange of signals was kept up without difficulty, and with the greatest precision. In less than twenty minutes forty questions were asked and replied to.

Receipts of the Paris Exhibition; American Reapers.

The report of the general receipts of the late Universal Exhibition in Paris has been published, from which it appears that the number of persons who visited the Palace of Industry, during the one hundred and ninety-eight days it remained open, exclusive of the days of opening and closing, was 3,626,934, out of whom 4,617 were holders of season tickets. The whole number of visitors slightly exceeded four and a half millions, and the receipts fell a little short of three millions of francs. The French Exhibition, in a pecuniary point of view, has proved a failure by comparison with that of London, where the receipts amounted to about twelve millions of francs, and the net profits to about half that sum.

La Presse, the most extensively circulated newspaper in France, has devoted no less than four columns to a historical sketch and minute description of McCormick's reaping machine with an account of the extraordinary results obtained in all the recent trials before the international jury; and it bestows great praise on American inventions generally.

Wind Flouring Mills for the Prairies.

The Peoria (Ill.) *Transcript* is informed that the Rochester (N. Y.) Mill Erecting Company intend to place in operation fifty mills on the western prairies during the year 1856, the motive power of which is to be the wind alone. The *Transcript* adds:

"We hear a company is to be organized in Peoria for the immediate establishment of one of these windmills. We understand that the cost of a windmill in operation with two run of four-feet stones is only $5000. That includes the cost of building, machinery, and every requisite, including the right to use the patent. One on this plan is now in operation at Rochester, N. Y., and with two run of stones thirty bushels of grain are ground in an hour. The running of the mill by wind power is ten months in the year, about the average time of steam power, deducting repairs, &c., and more time than most of the water mills. It is represented to be just what is wanted on the prairies."

[So much for the improvements made during the last few years on the old windmill, and all coming from suggestions made through our columns.

A New Perpetual Motion.

A new perpetual motion is astonishing the wise people of New Haven, Conn. The *Register* says, "Mechanics are flocking from all directions to see Perpetual Motion—the invention of a gentleman of this city. All concur in the opinion that it is a wonderful piece of machinery. There is no cheat or collusion about it, no trick, but it is a self-moving, power-supplying machine, which will run until it is worn out. As such, it is a triumph of ingenuity. The inventor is an accomplished mechanic, who has spent years in perfecting it, whilst confined to his house by ill health."

The *Palladium* says that "the machine certainly goes, and there is no chance, as anybody has yet discovered, of its being moved by any extraneous or concealed force."

A correspondent of the *Courier* thus describes it:—"I have been an inventor for several years, and have been taught, by a long series of experiments and practical investigation, to believe that what is possible man can accomplish. I was not surprised when I saw the announcement in your journal recently of the apparatus invented by Mr. E. P. Willis, purporting to be a perpetual motion, although there are thousands who do and will treat it with disdain, or as a thing impossible. The great secret is the particular and double inclination of the main wheel and gravitation. In all former attempts at a perpetual motion, the great object has been to overcome gravitation, but in this instance, without gravitation the machine would stop. The driving wheel being on an inclination of 23 1-2 degrees, is the particular degree at which all metallic bodies which are placed on its disk will retain their position through the effects of gravitation, and if the shaft is adjusted at 24 degs., those bodies will cease to act and slide off; or if the wheel is inclined to 23 degs. there will not be sufficient power to cause the cylindrical weight to pass the eccentric wheel which is attached to the shaft supporting the fly wheel.

Another very nice adjustment of the driving wheel is its adjustment of a vertical shaft out of line 1-8 of an inch, and as the principle on which this machine acts will work both ways, it is only necessary to shift the step 1-4 of an inch to reverse the motion."

[If, according to the *Register*, this is a *self-moving* and *power-supplying* machine, it can very easily tell us how the power is obtained, and how it supplies the *power*. If, according to the *Palladium*, it is not moved by an extraneous or concealed force, so far as has been discovered, by what force then is it moved?—Is it moved without force, or does it contain the elements of force in its mechanical parts? The description of the machine by the correspondent of the *Courier*, is as clear as mud, with the exception of one point, and that is the particular inclination of the wheel, viz.: 23 1-2 degrees. This inclination of the wheel and gravity is the secret, according to him, of its perpetual motion. If it is but inclined half a degree less—23 degs.—then the perpetual motion is killed at once, according to his description.

There can be no such thing as a perpetual motion, for no wheels nor combination of mechanism contain power in themselves to set and keep them in motion. Clocks have been constructed that have gone on for years without re-winding, but they did not contain the elements of force within themselves. They were first set in motion, and the first impulse carried on the work until they stopped. Mr. Willis does not probably claim his machine as a perpetual motion, but as a skillfully constructed machine, the moving parts of which meet with so little resistance that it requires an exceedingly minute amount of power to move them. Any body once set in motion, by the law of *inertia*, would move on forever in a straight line, without a change of velocity, were it not for the resistance of the atmosphere, friction, and the attraction of other bodies How does this machine overcome these resistances? If it does not overcome them, it will cease to operate some day.

[For the Scientific American.]

Granite Dust a Fertilizer.

I was much pleased to find an article in your paper of the 23rd inst., that "Granite dust was equal to the best manure."

In the year 1849 I published a small work of 42 pages, on agriculture, which was distributed gratis to intelligent farmers; more than 100 copies being presented to cultivators in Massachusetts. In that work I introduced granite rocks as a fertilizer, as follows:—"In traveling in the States of Maine and New Hampshire, the summer before last, I noticed the mountains to contain any quantity of pink felspar rock; and as limestone was rarely found, and I understood the same, when burned, was too costly to use as a fertilizer, I would recommend farmers to grind the felspar, and try its efficacy. I should judge, from its components, that it would form a fertilizer of no mean quality. It contains seventeen per cent. of alumina, three per cent. of lime, and thirteen per cent. of potash. I have never heard of its being used for such a purpose, but as it contains thirty-three per cent. of fertilising materials, and more potash than is contained in the ashes made from oak wood, I should consider it would be well worth a fair trial.—Any felspar, either white or colored, will be equally efficacious. I have referred to felspar more on account of its being the most abundant mineral in primitive rocks, than because it is the best. Mica contains more alumina and more potash; hornblend nearly four times as much lime, and basalt thirty per cent. of alumina, ten per cent of lime, and six per cent. of magnesia. Any primitive rock, therefore, in which quartz is not too abundant, will answer when ground, if the felspar will answer."

My opinion having been confirmed by direct experiment, I congratulate our Eastern States in possessing an inexhaustible supply of highly fertilizing materials.

WM. PARTRIDGE.

Binghamton, Dec. 24th, 1855.

Compressed Air Engines for City Railroads.

MESSRS. EDITORS—In your notices to correspondents, of the SCIENTIFIC AMERICAN Dec. 29th, 1855, you reply to "W. G.. of N. Y.," to the effect that compressed air is more expensive than steam as a motive power. Obviously, this is correct as a general rule, but there may be cases where steam power is inadmissible, and then, as in the case of our city railways, the question of economy is between compressed air and horse power. I believe that the compressed air plan is a most desirable one for our city railways, in lieu of the miserable and inhuman horse-flesh one. Depots could be established at every two or three miles with powerful air pumps, keeping globular reservoirs always charged, so that the charging of long cylinders under the seats of the cars would be but the work of an instant, after the connection was made. When breaking up, the engine should be reversed, not in its rotation, but in drawing in the external air and forcing into the reservoir instead of receiving it from the reservoir, and allowing it to escape in the air.

I hope your correspondent will get upon that tract, and have your encouragement, for I am satisfied that it may be made a profitable one.

Compressed air engines are not new, for they have been used considerably on railways in England, and were called "poneys." They did not succeed there, for the reason you have assigned, but here the case is different.

THOS. PROSSER.

Brooklyn, Jan. 2nd, 1856.

[Like our correspondent we believe that compressed air engines may be economically applied to city railroads as substitutes for horse power; even if they were to prove somewhat more expensive they are preferable.

Gloves.

Belgium is the great glove manufactory of the world. It is stated that from one establishment, last year, 400,000 dozen pairs were exported to England and America. There are 3,000 hands employed there.