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THE NEW COMMISSIONER OF PATENTS

The President has appointed GENERAL MORTIMER D. LEGGETT, of Zanesville, Ohio, U. S. Commissioner of Patents. He will enter upon his duties immediately upon being confirmed by the Senate. A short notice of the new Commissioner was published upon page 9, No. 1, of the new volume. | of decennial fairs into annual exhibitions of specific objects.

THE PROPOSED FAIR OF THE AMERICAN INSTITUTE IN 1876.

The proposition to hold a grand International Exhibition in in 1876, on the occasion of the centennial celebration of the birth of our Republic, has long been entertained by the Board of Management, and now seeks tangible shape in a memorial to Congress and a circular addressed to whom it may concern.

The occasion selected for this grand project is very appropriate, and must at once challenge the support and insure the sympathies of all patriotic citizens. We hope that something worthy of the country, and in keeping with the high reputation of the Institute, will be accomplished. Before entering upon a plan of this magnitude it will be well for the managers to agree upon all the details, and to count the cost.

We had occasion, recently, to speak of the importance of scientific administration and to deplore the lack of this potential energy in the public and private affairs of our country; and we are forcibly reminded of this topic when we chanics special studies. It is with the intent to give clearer contemplate the immense undertaking the Institute has pro- notions of the proper use of this term that the present artiposed to itself. Without rare administrative ability and the cle has been written. services of the best talent of the country, the exhibition is certain to be a failure, and we cannot contemplate its inception without great misgiving.

In a circular, prepared no doubt for the information and isstruction of Members of Congress, entitled, "The American things animate as well as inanimate. When the conditions Institute and its Mission," we find an interesting account of necessary for a given effect exist in connection with any body what the society has accomplished towards the encouragement of American industry. It appears that thirty-nine National Exhibitions of the products of our own country have been held since the foundation of the Institute in 1828.

These fairs had small beginnings but they have shown a steady growth, and the last one was the best of all. Considering the limited means at their disposal and the want of a suitable building in which to hold their exhibitions, it cannot be denied that the managers have produced results very cred: cule in a mass, or a change of state or condition (if there be itable to their administration and full of encouragement for any such), which we cannot attribute to motion of matter. the future. The award of prizes, medals, and diplomas, by ingenuity, arouse the emulation, and encourage the competition of inventors, manufacturers, and producers in every branch of industry and the arts. The officers of the Institute have shown themselves able to grapple with an American Fair, and they may possibly be equally successful in the

The circular speaks of the valuable scientific library of ten thousand volumes, to which the members of the Institute have free access; and of the four clubs now in full operation, he proceedings of which have an enormous circulation throughout all parts of the Union. The American Institute enjoys the rare privilege of having its transactions published form, and can be consulted in every public library of the this sense it is used in the old saying, that "what is lost in of thought, and to convey a knowledge of scientific facts,

whose proceedings are so extensively read, and in this respect it challenges competition.

We understand that the Institute has in real estate and bonds. The society makes a brilliant show in the extent of its property and the good it has accomplished. It now becomes a grave question whether it is wise to endanger the estate or risk the usefulness of the American Institute by entering upon a scheme of such proportions as is indicated in

The hundredth anniversary of our independence can be celebrated by the Institute without an appeal to Congress. It is the obvious duty of the citizens of New York to put up a suitable building for annual fairs and permanent libraries and collections. It is an unspeakable disgrace to us that such an edifice has not long since been constructed and filled with models of machinery and specimens illustrating the material wealth of our country. Congress must not be asked to make any grant for the purpose and ought to refuse it if they are asked. The American Institute can stand on become instruments for the transmission of power. its own merits. If the citizens of New York will not believe a World's Fair ought at once to be abandoned. There is not land enough to spare on the island of New York, and not sufficient money to put up a building large enough to hold type specimens of the industry of all nations.

The Paris Exposition of 1867 was the last and best of its kind. We shall never see anything like it again. The building covered forty acres of land; the park outside embraced eighty acres more, and there was an island of fifty acres in the river Seine set apart for agricultural implements. There were fifty thousand exhibitors, and the money value of the articles in the Exposition was estimated at one hundred million dollars. And vet in the face of all these statistics the circular says:

"In the hands of the long-tried and experienced management of the Institute, the World's Fair of 1876 will, without doubt, eclipse those of the Old World." The committee who have the matter in charge would do well to follow the example of the English Commissioners, many of whom had served in 1851 and 1862, who, when the question of another World's Fair, in 1872, was proposed, unanimously decided that such a project, in the present age of industrial progress and invention, was impossible, and they have changed the whole plan

The true plan for the exhibition managers of the American Institute, is, therefore, to profit by the teachings of the Entional World's Fair. They will be much more likely to ob-New York city, under the auspices of the American Institute, tain money from our citizens when they ask for a million dollars, than when they come before the public with plans involving an outlay almost as great as the cost of the Pacific Railroad

MECHANICAL POWER.

We have often been obliged to correct errors in thought arising from the fact that many of the words used in scientific discussion still do double duty, retaining not only the edge was comparatively imperfect, but being also used to express ideas obtained through more modern research.

the language leads to greater confusion in thought among

In its primary philosophical significance the word power meaning has been extended to the conditions of change in puts it, ever since the days of ancient Rome. or mass of matter, we say that body has the power to produce the effect. Thus we may say a magnet has the power to raise a given weight of iron, etc. In a passive sense we also use the term, in such expressions as "the retina has the power to receive impressions of external objects." In the tional value, and what are its worthless characters; let them general sense of the term, then, power may be defined as recognize that no object is complete in itself, but is merely a ability to cause change, or the ability to be changed, whether | part of a vast whole, and that their office is to lead the child the change be the motion of a mass, or the motion of mole-

In the mechanical or dynamical sense, however, the word juries of competent men, has had the effect to stimulate the change in the definition of the term power is limited wholly pieces, and so shape them that every stone shall, at its proper to change of position in masses, or mass-motion, and the heat produced by friction. When we speak of overcoming resistance we are only using an expression which means the production of increased motion in masses of matter, or portions of masses, and the molecular motion of heat caused by fricbroader field of an International Exhibition. It is upon this tion. A vessel sailing through the water has three elements latter point, however, that we shall presently have something of resistance after attaining its maximum speed, namely, the displacement of water, the displacement of air, and the friction of the air and water upon its surface.

In a static sense the word power is popularly used to express the "tendency to produce motion;" or, in other words, it is used as synonymous with force in ordinary language.

In mechanics, even by some eminent writers, the term is country. There is no other society in the United States speed is gained in power, and what is gained in speed is lost and is worthless without science, the public should see that

in power." This is only true when the word power is used in a special sense. In this sense an engine that would pump a tun of water to the hight of fifty feet in one hour, by a government securities property of the value of three hundred succession of impulses, might be entirely insufficient to raise thousand dollars, and this amount is now steadily increasing it as a mass, unless a train of wheels or other device be emfrom the proceeds of the annual fairs and the interest on ployed to "change speed into power." Yet the power of the engine to perform work is the same in both cases. when the term work is understood in its general sense, as measured by the number of foot-pounds of resistance overcome per minute of time.

> We think it is much to be regretted that the use of the word "power" is not restricted in mechanics to its dynamical meaning. Its use as a synonym for force is liable to mislead the mind and cause confusion on points of mechanical science requiring the utmost clearness of conception.

> The term "mechanical powers," as applied to the elements of machines—the wheel and axle, inclined plane, lever, etc.is singularly inappropriate, and has been discarded by some of the best writers on mechanics. No one of these elements is a mechanical power, in any just sense of the term. It is only by the addition of other circumstances that they even

The want of clear conceptions of the distinction between in it, Congress cannot help the matter. The first thing to be the meaning of the term power, when used in its dynamical done is to secure a site and put up a building. The plan of sense, and the term static force, or pressure, has led to more absurdities than any other error in mechanical science. Some of these absurdities are apparent in the series of articles on "Perpetual Motion," now appearing in this journal.

OBJECT TEACHING AND SCIENCE,

The public are beginning to be awakened to the fact that technical education is the education they require, being in accordance with the conditions of modern civilization; and it is admitted that such technical education must be based upon a foundation of natural knowledge. The principles of the natural sciences must then, for the future, form an essential part of popular education; the only questions are, how far and in what manner are these sciences to be introduced? Whatever is to be the amount taught, educators are agreed that the first steps in natural science, or, in other words, in systematizing natural knowledge, are to be taken as early as possible. Early impressions are the deepest, and every child before its school days is already an untrained student of nature. The foundations of technical education should, therefore, be laid in the primary school; but whether commenced thus early or not, the method will always be the same. The child must be encouraged and guided in its natural habits of observing, and it must be led to systematize its observations, connecting them together by a chain of reasoning into groups of related ideas. This method is simply that known as "obglish Commissioners, and to abandon the idea of an Interna- 'ject teaching;" and you may as well try to fly without wings, or to teach geography without maps or globes, as to teach natural science without objects and diagrams. There is not a teacher, now-a-days, but has heard of this object teaching; there are hundreds who have tried to utilize it; there are "colleges" in which it is professedly taught as a system; and yet there seems to be no method applied to the inculcation of natural science more misunderstood than this, and no teaching in our schools, at present, more utterly destitute of good results. Ninety-nine out of a hundred who talk so glibly of object teaching, forget that it is merely a method—a method meaning formerly attached to them in the times when knowl- 'that has for its end to inculcate knowledge; that this knowledge to be inculcated is the essential part of the lesson; and that a thorough acquaintance with the subject must precede any The term "power" is such a word, and perhaps no other in application of this mere method of instruction. To stand up and give a lesson upon a cat, without knowing the first printhose who have not made the sciences of physics and me-ciples of natural history, is simply to go through a farcical parody; and authorities who have no better conception of the purposes of object teaching than this, set the cart before the horse; or, rather, they never hitch on their should-be-useful animal at all, but ride off upon this hobby, leaving the load means ability to do any act of volition. In this sense the of knowledge it was meant to draw standing in the rutsidea of power is connected with that of will, but the original 'where it has been standing, as Professor Huxley admirably

It has been recently advocated that every public school should be supplied with a collection of objects to illustrate the fundamental facts of natural science. By all means let it be so; but let the first use to which these are put be to instruct the teachers themselves in what they will have to teach. Let them learn what there is in each object of educato recognize its most important relations to other objects. In building up the edifice of knowledge, they must not use every rough stone indiscriminately, but they must teach the little builders to chip off the useless angles of selected time, fit into its proper place. If this be not done, the most instructive objects in the world will not raise a single line of substantial structure, but will rest upon the minds of the pupils as an unarranged heap of meaningless facts-facts which will not even be long remembered; and it is as well that they should not be, because utterly useless, being unconsolidated by any cement of reason.

We fear that no better end is attained by, or can be hoped for from, object teaching in our public schools, until, as we have said, the teachers themselves are thoroughly educated in the principles of natural science. To accomplish this, however, the ear of those who rule the teachers must be gained; and we raise the question whether the representaused not only in a general sense as ability to produce motion, tives of science should not have a voice in the management at the expense of the State of New York, and in this way the or to perform work, but, in a specific sense, as ability to do of our public school system? As object teaching is a mere information furnished by the sections is preserved in book some particular work under particular circumstances. In handmaid of science, is of use only to give scientific habits