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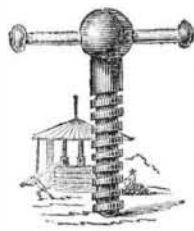
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## WHAT IS SCIENCE?



HIS is a question regarding which many individuals entertain exceedingly incorrect notions, and none more so than several personages who are considered the very embodiment of science. We have arrived at this conclusion from reading the remarks of leading members belonging to the American Association for the Advancement of Science at their late annual convention.

In reply to a resolution (it is not necessary to state here what it was) Professor Henry said:—"The objects of the association have been misunderstood. It is not its object to diffuse knowledge to the public; not to put forth popular information for the people of the city where the meetings are held; but to assist each other—to obtain new views, to criticise, to receive suggestions. We have been called, ironically, a 'mutual admiration association;' but the term is not well taken. We congratulate ourselves as being those who put forth the noblest truths, never before revealed to man. We feel that we have a high mission to fulfill—to make discoveries, to put them forth feeling that we are as ministers of nature to men. There is no happiness, no pleasure so great as that of scientific investigation. It is pleasant to impart knowledge to others, but higher than this—next to our holy religion—is scientific investigation: it is to receive light from above. We have come to love science for its own sake. We do not seek to live in the journals of the day, but in the world's history. We are to walk the paths of science, and leave it for others to gather the golden apples which we may scatter by the way."

Professor Pierce said:—"It has been thrown out, as Professor Henry has said, that it is a mutual admiration society—that it is devoting itself to useless objects; but such men would hear no gale in the wind, no murmur in the shell, would behold no power in the sunbeam. Yet, if such men had been present in the council chamber of Time, they would have advised in regard to the formation of the world. Those who say that the pursuits of scientific men are useless, would take the color from the rainbow and incorporate it into calico, or pluck the stars from the sky and make them into pins."

It will scarcely be denied, by almost any person, that the remarks of Professor Henry afford good grounds for bringing the charge to which he refers against the association. We regret this, because his scientific discoveries have been honorable to himself and of benefit to mankind; but we consider him in error in arrogating to the members of the association the rank of scientific high priests. He is also mistaken in his views regarding the journal literature of the day—it is the world's history. It brings to the public gaze and holds up to public judgment the science as well as the shams of public men, and it is fast becoming the first power of the State. Science is a collection of facts, properly arranged, relating to certain subjects; and scientific discovery consists in an accumulation of new facts. Judged by these standard rules, the majority of the papers read before the association were mere mental speculations, totally unworthy of the name of science. Scientific investigation is a noble pursuit; but when its aims are not understood, the most trifling objects are put in its place, and a dumb idol usurps the

throne of the true and the good, and this, we infer, has been done, according to the foregoing quotations. Man is not sent into this world to be a mere dabbler and babbler in scientific curiosities. He must use his powers for the glory of the Supreme Creator, and in doing the most good to his fellow-man. His life must be one of usefulness, or he fails in his "chief end."

In reading the reports of the proceedings of the Scientific Association, we are driven to the conclusion (we would it were otherwise) that it is devoting itself, in a great measure, to useless unscientific objects. The man who can "take the color of the rainbow and incorporate it into calico," does more for the elevation of his race and the dignity of science than is appreciated by the Cambridge professor. By bringing objects of beauty, in form and color, within the reach of all the people, their taste becomes elevated; and in this respect, the calico printer excels all the savans that were assembled at Springfield. The "fling" at the most beautiful, ingenious and refined of all the chemical arts, affords good evidence of mis-directed views regarding the objects and aims of science.

A number of the papers read before the association were upon useful subjects, but they should all have been of this character; and our object now is to call the attention of men highly gifted by nature and education back from the reveries of speculation to the beautiful realities of true science. It is a waste of mental power and a mis-direction of learning, to enter upon long disquisitions on the tails of comets, the probabilities of the asteroids being pieces of a broken planet, or whether the curious tracks in the Connecticut red sandstone are those of an extinct kangaroo or a goose, &c., &c.; and it is just such questions as these which have occupied most of the attention of the Scientific Association. If Professor Henry expects that any person will ever be able to "gather golden apples" from such trees, his faith must be very strong in the doctrine of improbabilities; we would as soon expect to gather grapes from thorns. It is our opinion, however, considering the utility and value of his own contributions to science, that charity prompted him to make an apology for the shortcomings of others. In doing so, however, we consider that real science has been lowered in its dignity by exalting trifling phantasies to the same position as useful discoveries.

## THE ARMSTRONG GUN—FORGING LARGE MASSES OF IRON AND STEEL.

We have received a communication from Mr. Alonzo Hitchcock, of Chicago, Ill., in which he claims to be the inventor of the method of constructing the Armstrong gun. He says:—

"In order to show you that it is not new in principle of construction, I propose to give you my little experience in this class of gun. Some sixteen or eighteen years ago, when Capt. Stockton proposed to forge his big gun of wrought-iron, my attention was particularly called to this subject of welding large masses of iron, not that there was any prospect of success in forging this gun as proposed, but from certain well-known practical difficulties it must inevitably prove a failure, as it did. It was very easy to tell how it could not be done; but to tell how it could be done was strictly a personal question, which I immediately set myself to answer, and really I found so many difficulties in the way that I tried many devices to avoid the necessity of welding such large masses of iron, as for cannon, only one of which I will describe here, which will go to show at least an extraordinary coincidence.

I proposed, then, in order to combine the greatest amount of strength with the least amount of material, to form a tube of suitable dimensions, either of cast-steel or wrought-iron, around which I proposed to shrink a series of heated bands, from end to end, when another tier of bands would be shrunk over the first, so as to break joints, and so on till the desired strength be attained.

Here then we have the Armstrong gun, practically and substantially the same; the only difference being in the manner of hooping or banding this tube. Sir William Armstrong uses a continuous band or bar of iron wound on hot from one end to the other, and then back, and thus continued until sufficient strength is acquired. Which of the two plans is the better could only be known by practical test, which I feel no interest in now, as I think now, as then, that there are some doubts about the

practicability of either invention under extraordinary circumstances not necessary to mention now."

In another part of it he states that he has discovered the problem of forging large masses of wrought-iron, or cast-steel, or both combined, as, for instance, lining the inside of a gun with steel or welding on a steel breech, after the barrel has been bored and rifled. And this he proposes to do in masses of metal from 100 pounds to 20 tons, without the least possible chance of a flaw or imperfection. He says:—

"I can forge any amount of wrought-iron or steel, as in guns or shafting, into one solid homogeneous mass, when every part and parcel of said mass shall be as perfect as the best hammered iron or steel, and more perfect in its texture and tensile strength than the best rolled iron of commerce, and this can all be done by one man, if necessary. Being able to accomplish all this, I am prepared to make a gun as much superior to the Armstrong gun as the Armstrong gun is superior to the ordinary gun, mine being far superior in strength and durability, lighter, and at least 50 per cent. cheaper!"

The method of constructing guns similar to that for which Sir William Armstrong has received such distinguished honor, has been claimed by several parties, and we think it has been pretty well established that it was invented many years before Mr. Hitchcock devoted his attention to the subject, according to the foregoing statement. The improvements which he claims, however, appear to be new, and if he can accomplish all he purposes, he certainly deserves very high consideration.

## A GREAT WATER-POWER IN MARKET.

On another page will be found an advertisement of the Lockport Hydraulic Company, regarding which we will voluntarily make some additional statements. The fall at Lockport, which is about 54 feet, with 32,899 cubic feet passing per minute, is equal to 3,364 nominal horse-power, 25 per cent. of which is deducted, thus leaving a fair margin of 2,500 actual horse-power. The fall is produced at the declivity of the table-land which forms Niagara's cataract, and the water is supplied from the same perennial source—Lake Erie. The city is something of a curiosity, as the Erie Canal passes through it by a lofty flight of water stairs, which have a most imposing appearance. The communication by canal and railroad is most convenient, and the country around is the very garden of New York State, rich in wheat and fruit. With the proposed arrangement of supplying mechanics with buildings and shafting, at moderate rates, Lockport should become a great manufacturing city. It is some years since we visited it, but it was then a smart manufacturing place, having a large cotton-mill, a woolen-mill, and several grist and saw-mills. We do not know how it is supplied with fuel—a most important consideration for manufacturing purposes—but we suppose it obtains an abundant supply of anthracite coal from the East, and bituminous coal and wood from the West.

AN IMPORTANT WORD TO SUBSCRIBERS.—Had we not changed the time of the commencement of our annual volume, the present issue would, in the ordinary course of things, have been "No. 51, Vol. XIV," and next week's number would have closed the volume. A large number of our old subscribers remitted their subscriptions in June and July, so as to commence with the "New Series." We find, however, on examination of our books, that there are about 4,000 subscribers who did not renew their subscriptions and whose terms therefore expire with the next number; and as it is our invariable rule to discontinue the paper at the expiration of the subscription, we urge our friends to renew theirs without delay. We trust also that they will endeavor to induce some of their neighbors to join with them in the formation of a club, as to clubs of 20 persons the paper is sent for \$1.40 each, while to clubs of 10 the subscription price is only \$1.50 each. These exceedingly liberal terms, for a yearly volume of 832 pages, replete with valuable information and illustrated by about 600 original engravings, render the SCIENTIFIC AMERICAN indisputably the cheapest and best journal of its class in the world. This is the concurrent testimony of the press and the reading public of the country, and it will be our determination to maintain its high character. Friends! do not forget to renew your subscriptions promptly, and thus preserve the first volume of the "New Series" unbroken.