

# Scientific American.

MUNN & COMPANY, Editors and Proprietors

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

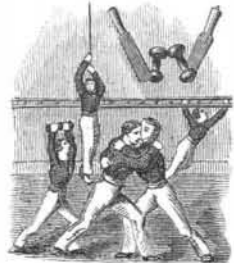
O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Two Dollars per annum—One Dollar in advance, and the remainder in six months.  
Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.  
Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.  
See Prospectus on last page. No Traveling Agents employed.

VOL. III., No. 16....[NEW SERIES.]....Sixteenth Year.

NEW YORK, SATURDAY, OCTOBER 13, 1860.

## PHYSICAL TRAINING IN COMMON SCHOOLS.



WE see that the Superintendent of the Boston schools recommends the general adoption of gymnastic exercises as a regular part of school training. It seems to us that there is no movement of the day of greater importance to the scholars individually, or which is destined to have a greater influence upon the well-being of the country, than this of systematic physical training of children. For *success in life*, vigorous health is of far greater importance than high intellectual culture. *Energy* is what rules the world. Take two boys, equal in every respect, box one of them up in school from morning till night and from year to year, cultivating his mind at the expense of his body, till his nerves have outgrown his muscles, and his brain has outgrown his stomach; while the other boy receives a fair but equal development of both mind and body—and what is the result in the two cases? The scholar graduates perhaps with the highest honors, but he leaves college a feeble and complaining invalid; intellectual and refined, he shrinks with nervous sensitiveness from the rude shocks of the battle of life. The result is, that he is thrust aside in a corner, or trampled under foot in the race. On the other hand, the man who comes forth upon his career in possession of a vigorous constitution, has the backbone, the nerve, the energy, that enable him to win the great battle that every human life is. His days are filled with healthful and happy activity; his slumbers are sweet at night; his cheerfulness (the natural effect of good digestion) makes his presence a pleasure to all who know him; he becomes the father of healthy offspring, and fills his home with merry voices; in short, fulfills all the purposes of his being, and leads a prosperous, happy, useful and successful life.

But we have conceded too much in yielding the palm of intellectual superiority to the scholar whose brain is overstuffed. John Whipple once asked Daniel Webster to what he attributed his marvelous power of mastering complicated and difficult questions; Webster replied that he attributed it to his habit of never using his brain when it was in the least degree fatigued. The great fact that the time during which the human brain can continue its action is limited, is one of the utmost importance, but it seems to have been generally ignored by those who have had the management of our schools. A New York school commissioner, with leather lungs and a cast iron head, may insist that a child who has been boxed up six hours in school shall spend the next four hours in study, but it is impossible to develop the child's intellect in this way. The laws of nature are inexorable. By dint of great and painful labor, the child may succeed in repeating a lot of words, like a parrot, but, with the power of its brain all exhausted, it is out of the question for it to really master and comprehend its lessons. The effect of the system is to enfeeble the intellect even more than the body. We never see a little girl staggering home under a load of books, or knitting her brow over them at seven or eight o'clock in the evening, without wondering that our citizens do not arm themselves at once with carving knives, pokers, clubs, paving stones or any weapons at hand, and chase out the managers of our common schools, as they would

wild beasts, that were devouring their children. Indeed, they are worse than wild beasts, for those destroy only the body, but these fiends consume both body and mind of the helpless innocents who fall into their clutches.

In Boston, the system of studying out of school has been prohibited in relation to the girls, and we should be rejoiced to see this city take the lead in extending this prohibition to all the scholars. We are very glad to see that the time for gymnastic exercises is to be taken from the study hours, and not from those given to play—"Experience having shown," says the Superintendent, "that the scholars learn more when a portion of the time is given to these exercises than when all is devoted to study."

We hail the introduction of physical training into our common schools as being calculated to make the Americans the finest race of men, physically, that the world has ever seen; but we value it more as an important step in carrying to a still higher point the unparalleled intellectual cultivation of our people.

## DECOMPOSITION OF STEAM—AN OBSTINATE CRITIC.

Our friend, *The Engineer*, appears to be a stubborn pupil. We made the plain and concise statement that a white hot block of iron weighing 100 pounds, in the presence of steam, would take up 30 pounds of oxygen, and be wholly converted into oxyd of iron. The *Engineer* contradicted us flatly. We replied to our cotemporary in a friendly and conciliatory spirit, and hinted that if he would bear in mind the porous nature of a film of oxyd of iron, he would be able to take in the truth of our statement. We really hoped the difference between us was happily settled, and that our friend had added an interesting fact to his stock of chemical knowledge. But his issue of the 27th ult. is still perverse, contradicts again, and quotes the professors against us. He says—"Professor Faraday's authority is against the SCIENTIFIC AMERICAN, and so is that of most chemists of eminence." This very strong expression discloses the fact that instead of pondering on our good-natured hint, he rushes to his library to find what chemists of eminence have said, and in his zeal to confront us forgets the real point at issue.

The *Engineer*, if he is really desirous of becoming posted on such subjects as the oxydation of iron, will do well to take a start from some fundamental and elementary stand point, and thus reach his conclusion by a slow but sure step by step. We furnish a few facts for his careful contemplation. Iron is very easily oxydized in the presence of vapor of water at the ordinary temperatures; it is covered with a film of rust, which thickens in proportion to the exposure, until all the iron may be converted into rust. We commend to our friend the philosophy he may extract from a rusty nail; without searching far, he will find a nail that has been entirely oxydized, so that he can pulverize it in his fingers; when found, let him make a note of it. A few years ago, the newspapers reported that the ax with which Noah hewed out his ark had been found, out West, in the body of a tree into which he had struck it when his work was done. This story, although incredible, was founded on the well attested fact that a mass of iron rust in the form of an ax had been found in a tree, and there can be no doubt that the mass of rust proceeded from a solid iron ax. Now, all these cases of rusting depend upon the decomposition of water. Our perverse friend here might tell us that water is not steam, and that cold iron is not white hot iron; and we are obliged to call his attention to the fundamental fact that chemical reactions of this nature are favored by a high temperature, from which he will possibly conclude that the nail and the ax would have been changed to rust in an immeasurably shorter time had they been white hot.

And as to "most chemists of eminence," they will tell the *Engineer* that steam is very rapidly decomposed in passing over white hot iron, and that the iron, in the shape of turnings, wire, nails, &c., is, in the process, wholly converted into oxyd. In the actual manufacture, it is desirable that the iron be pretty finely divided, for the reason that more surface is offered to the steam, and that the film of oxyd shall not become so thick as to materially retard the contact of the steam. Will not the *Engineer* observe that our 100-pound block of iron is the iron turning, or the bit of wire on a larger scale? Surely he will not tell us that, although the oxyd is po-

rous on the wire, it will be impermeable on the 100-pound block; we shall wholly abandon him as a hopeless case, if he be so inconsistent.

Finally, if, in all the light we have thus above furnished, the *Engineer* is unable to see that we have told only the truth, we recommend him to apply the *experimentum crucis*, get a 100-pound of iron, heat it white hot and pass steam over it, and continue the white heat and the passing steam. If the *Engineer* will be faithful to the experiment, we guarantee the result will be as we have stated. But we warn our friend that he must have patience, for he will not burn up his iron in an hour or a day. Let him prepare himself for a labor, say of six months, for towards the end the operation will go on very slowly, for the little mass of iron in the center will be enveloped in a thick covering of rust, which will act like ashes on a charcoal fire.

Our readers will understand, of course, that the original remark concerning the 100-pound block was simply to illustrate the fact that white hot iron will decompose steam, combine with oxygen, and be increased in weight in the proportion we stated. That this process will be obstructed as the thickness of the film of oxyd increases is manifest, but that it will be entirely stopped, the *Engineer* and any array of professors will not convince us. We respect the professors highly, but we make it a rule not to trust them when they wander from the truth.

## A WONDERFUL BILLIARD PLAYER—MONS. BERGER, THE FRENCH CHAMPION IN AMERICA.

A few evenings ago, by the invitation of Michael Phelan, the champion billiard player of New York, we had the pleasure, with a large number of other city editors, of witnessing the wonderful skill exhibited by M. Berger, in the dexterous use of the cue, making the balls obey his will as if by magic. Mons. Berger has brought from Paris his own table, which is quite a novelty by the side of a first-class American table. The French table is not much more than half as large as the American one, is built very heavy, and without pockets.

The following are some of the most wonderful exploits by Mons. Berger, whose weight, we should judge, could not be less than 300 lbs. His most astonishing performance consists in holding the cue perpendicular over the ball and striking it with such skill as to cause it to twist to any desired part of the table, to jump, carom and perform all kinds of fantastic freaks, quite marvelous to the beholder. The following are some of the most surprising shots we witnessed:—

Placing a ball in a hat, and making a carom by causing a ball to jump into the hat.

Making a carom by causing a ball to travel a portion of the distance on the cushion.

Making *massé* shots from various portions of the table, causing the player's ball to twist to any point previously marked.

Jumping the player's ball over a cue held over the table horizontally, and causing it to draw back, caroming on a ball under the cue.

Jumping the player's ball from the table into a gentleman's hat.

Admirers of the game of billiards will find Mons. Berger at the extensive rooms of Mr. Phelan, corner of Broadway and Tenth-street, where he proposes to give a series of artistic entertainments in this art.

## THE TRUTH OF SPIRITUALISM DEMONSTRATED.

A short time since, Mr. Campbell, a photographer in this city, while engaged in some experiments, after cleaning a glass in the usual manner and covering it with the collodion film, took the picture of a chair standing in the room. On developing the picture, the image of the chair was seen perfectly portrayed, but, miraculous to relate, portrayed with equal distinctness, a boy was seen sitting in the chair! An account of the circumstance, headed "The Photograph of a Ghost," was published in the *American Journal of Photography*, with a technical explanation, perfectly clear to photographers, but not so intelligible to ordinary people. At a recent meeting of the Spiritualists in the upper part of the city, the occurrence was described and excited a great deal of interest, as affording the most direct and tangible proof that the departed do revisit the earth in bodily form. The office of the *Journal* was visited to