

# SCIENCE

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FRIDAY, DECEMBER 9, 1887.

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IN OUR ISSUE of Oct. 28 we called attention to the fact that a committee had been appointed by the New York Academy of Sciences to raise funds to erect a monument over the remains of Audubon, who now lies buried in the south-western portion of Trinity Cemetery, near 153d Street and North River. Two or three years ago some gentlemen who visited the cemetery noticed the name of Audubon on a vault which was then in much need of repair, and finding, on inquiry, that this was the burial-place of the great ornithologist, suggested the plan of having his remains removed to a more conspicuous position. On making proper representations to the authorities of the cemetery, they were met with great courtesy; and after some months, with the consent of the Audubon family, it was decided to change the position of the plot to a place which will be opposite the extension of Audubon Avenue when it is continued to 155th Street, as it probably will be. This plan was accepted by the Audubon family during the last summer, and it was then proposed to erect in the new plot, by national subscription, a monument worthy of the greatness of the man. After these arrangements had been completed, the plan was laid before the meeting of the American Association for the Advancement of Science in this city, but no action was taken. At the first meeting of the New York Academy of Sciences this fall, a committee was appointed to raise funds for the monument. Since the date of its appointment, this committee has been quietly at work. After organizing, it communicated with different scientific societies all over the country, from which the most enthusiastic replies have been received. It was decided by the committee, that, on account of the near advent of the election, it was unwise to do much active work at that time; but now that the election is over, the committee are actively at work, are preparing the designs for the monument, and wish to solicit subscriptions from all parts of the United States. The whole country has for years been justly proud of Audubon's work, which was received both at home and abroad with the greatest enthusiasm. It is considered one of the greatest treasures of any public or private library. Some of the copper-plates of this great work now hang in our museums, and are framed and hung like valuable pictures in the houses of patrons of the arts in this city. It is the founder of American ornithology that it is sought to honor, to whom natural history in this country is almost as much indebted as England is to White of Selborne. It is hoped that every one that loves nature will subscribe, and ask others to subscribe, to this fund. It is intended by the committee, as soon as the monument is ready, to have some public ceremonial worthy of the occasion at its unveiling in Trinity Cemetery, and in this way bring into further prominence the great services which Audubon has rendered to the scientific study of natural history in this country. Contributions, however small, may be sent to the treasurer, Dr. N. L. Britton, of the School of Mines of Columbia College.

IT IS CURIOUS to watch the different approaches made to the same question by various countries. There is now, as is well known, a very general movement throughout this country in favor of what is known as manual training in education. After much misapprehension and tedious explanation the leaders of this movement have finally managed to make the educational public understand that they advocate manual training mainly for its educational value, and only incidentally for the economic benefits which will

undoubtedly flow from it. In England, however, where a similar movement is gaining force, the point of view is almost exclusively the economic, and but little is heard of the educational value of manual training. The Englishman desires manual training to take the form of technical or trade instruction, in order that England's waning commercial supremacy may be restored and retained. It is very necessary, therefore, in following the English movement in favor of manual training, to understand that its arguments and its point of view are wholly at variance with those of the American movement to introduce manual training into the public schools. Indeed, Mr. William Mather, one of the best authorities in England on the subject, as well as one of the few Englishmen who thoroughly comprehend the American movement, has said that the English mind has not yet sufficiently advanced educationally to adopt the American view, and that the only sort of manual training which can be successfully advocated in England at present is that which will come under the head of technical education. The inaugural address delivered at University College, Liverpool, by Prof. Hele Shaw, and reported in a recent number of *Nature*, illustrates excellently what is said above. Professor Shaw began his address by calling attention to the vast and almost incredible change which the present century has witnessed in the industries of the world, and he emphasized the fact that a few years ago circumstances combined to make Great Britain the principal commercial and manufacturing country of the world. The artificial conditions which brought about this state of things could not and did not last. Foreign nations began to establish mills and work-shops of their own, and, what was of even greater importance, they recognized the necessity of spreading technical knowledge by all possible means. To accomplish this, technical schools instituted and supported by the state, at which instruction could be obtained free or at a merely nominal expense, were established by the more progressive countries. The result has been that during the past twenty years numbers of highly educated men have been sent out who were prepared, on becoming foremen, managers, or employers of labor, to take advantage of the latest discoveries and improvements in the various branches of industry, in other words, to use their brains with their hands. The eventual effect of this on England's industrial status could be safely predicted, and that it was disastrous the reports of the recent royal commissions on trade depression and on technical education conclusively prove. It must not be thought, however, that the English themselves are not alive to what is going on about them, and the importance of late assigned to the subject of technical education proves that they are looking in the right direction for the remedy. The National Association for the Promotion of Technical Education has on its roll of membership some of the foremost men of science, men of business, and men of literature in Great Britain. The special government bill which was introduced on this subject at the last session of Parliament is proof that official circles are alive to what is needed. Professor Shaw then asks what the term 'technical education' really means, and with a touch of humor says that one very general answer to the question is, "Something to meet the German competition." "This," he adds, "grotesque as it may seem, is much nearer the truth than most of the other definitions of technical education." Of these he quotes a number, and then proceeds to discuss the results attained by the Science and Art department during the past ten years. The other central agency, which has been at work for several years in promoting technical instruction, is the City and Guilds Institute of London, and he points out the very interesting and valuable results

which this institution has accomplished. "When it is considered," he continues, "what splendid technical training the workshops and manufactories of England have afforded, there will appear to be very good reasons why, originally, technical schools were not so extensively instituted in England as on the continent." The speaker pointed out that England was, taken as a whole, after all not in such a deplorable state with regard to technical education, and then described that education as of two kinds, general and special. "General technical education may be said to be that necessary in all large centres of population, being the preparation for such callings as engineering, architecture, medical science, and other professions which a certain percentage of the inhabitants will always follow, besides training of another kind suitable to the artisan class. Special technical education is that necessary in a locality where there are special industries, instances of which will readily suggest themselves." The remainder of the address was devoted to considering the educational work of Liverpool and its technical requirements. This brief abstract will suffice to show how diverse are the means of approach to the manual training problem which are being followed in England and in this country.

#### PHYSICAL TRAINING.

THE American Association for the Advancement of Physical Education held its third annual meeting in Brooklyn on Nov. 25, and was well attended. Prof. Edward Hitchcock of Amherst College presided. Papers were read by him, and also by E. H. Fallows of the Adelphi Academy. The title of the latter paper was 'Physical Training in Elementary Schools in the United States,' being an extract from the report of the Board of Health of New Hampshire. Dr. Edward Hitchcock, Jun., of Cornell University, read a paper on the uses of physical measurements to the individual. In the attempts to establish anthropometry on a scientific basis the weight of individuals was first taken as a standard, but this had to be abandoned, and he thought we could now say with a certain degree of exactness that human measures increase with the height. It is extremely difficult, if not indeed practically impossible, to secure the exact dimensions of any man. Especially is this so when it is attempted to obtain the measurements of the chest and shoulders. Six experts might examine the same individuals, and their measurements would probably all differ. The testing of lung capacity is very variable, some individuals giving results which are of value, while others do not use the thoracic muscles at all, but simply bring into play the muscles of the pharynx. Some foreign countries, recognizing the difficulties in the way of obtaining exact measurements of parts which were liable to vary, had adopted the length and breadth of the head, ear, foot, and finger, and the height of a man in the sitting position, as the best, making use of them in descriptions of criminals. Dr. Hitchcock thought that to determine the physical powers of an individual, good judgment on the part of the examiner was of great value. In fact, a good judgment without measurements he regarded as better than good measurements without judgment.

Dr. Savage, director of the Berkeley gymnasium, New York, and Dr. Sargent of Harvard University discussed Dr. Hitchcock's paper. The latter said that while some foreign nations had done more in obtaining and recording measurements of parts of the human body, the United States was far ahead in true anthropometry, that is, the measurement of the whole man; but this subject was still in its infancy, and it would be folly for the association to publish views which in the present inexact state of the science of anthropometry might and probably would be controverted in a short time. He did not think it was proper for an association which had had but two or three years' experience to express views which might be taken by the world at large as a basis for physical education. For his part he regarded it as a life-work, and he proposed to remain silent until he had arrived at results which he could swear by. Dr. Hitchcock of Amherst differed with Dr. Sargent. No science ever approached exactitude except through a long course of mistakes and subsequent corrections.

The next paper was on military training as an exercise, by Dr. J.

W. Seaver of Yale College. He took the ground that while military training was well adapted to the adult, it was not the best for the young. The element of sport or fun which characterized the active life of all animals in their early years should not be wanting in the exercise of the human young. General Molineux of Brooklyn, in the discussion of this paper, said that although colleges, by their well-equipped gymnasiums, had done much for their students, they had done but little for the masses. He hoped to see physical training adopted in the public schools, and urged the association to do all in its power to accomplish that object. He thought that military training even for the youth was very valuable, not only as a means of developing their strength but as fitting them for the defence of their country, a duty which they might be called upon to perform. John S. White, LL.D., head master of Berkeley School, New York, took similar ground with General Molineux, but believed that calisthenics and military drill should be combined in the development of youth. At the termination of the discussion the association adjourned.

#### AMERICAN PUBLIC HEALTH ASSOCIATION.<sup>1</sup>

ONE of the most instructive papers read before the American Public Health Association at its recent meeting at Memphis was that of Dr. E. M. Hunt, Secretary of the State Board of Health of New Jersey. It is entitled 'The Prevention of Microphytic Diseases by Individual Prophylaxis.' It is so full of suggestion, and the subjects which it discusses are matters of such general interest, that we reproduce the paper *in toto*.

[PAPER BY DR. E. M. HUNT.]

During the last twenty-five years no subject has been more prominently before the students and practitioners of hygiene than the consideration of new methods, or new applications of old methods, for the prevention of disease.

This inquiry, to some extent, involves investigation into the specific entity of disease. But a still more hopeful direction of investigation is to find out what fertilizes it or makes it more likely to be severe, what sterilizes it or makes it more likely to be mild, or what will make the human system resistful to the sedation or propagation of the disease, so that it will not occur.

The first great discovery in this direction was that of the modifying influence of inoculation.

It could not have been merely the cathartic and the changed diet of a few days that reduced the mortality from inoculated small-pox to such a minimum. The prevalence of the custom was at once the certification of the terror of the caught disease and the innocence of the conferred or inoculated disease. Yet it was the same disease without any effort at attenuation.

It was the introduction of the virus into the skin or areolar tissue, instead of by inhalation, that seemed to result in modification. Its approach was through the periphery, instead of by a central and vital organ. The chief safety was in the fact that the involvement of the lungs and the secondary fever were avoided.

Somehow, by the metastasis or diversion or mode of attack, the system grew tolerant of the malady, and was able to throw it off with comparative harmlessness.

It has fallen to my lot frequently to see the same remarkable mitigation in the inoculation of cattle with the virus of contagious pleuro-pneumonia.

When the infection is conveyed by the breath, it seizes upon the lungs and pleura. Frequently, in three days after it is manifested, the spongy organ of two or three pounds has become so solidified with tenacious lymph that it has a weight of thirty pounds, and death is the speedy result.

But introduce this virus into the muscular tissue of an extremity and all symptoms are more gradual. There are local swelling, the throwing-out of lymph amid muscular tissue, and slight constitutional disturbance; but the lungs escape, and fatal cases are exceedingly rare. Not only this, but other animals will not contract the disease, and immunity is secured. These facts as to the effect of the different modes of conveyance of a disease have their practical bearings, and still invite investigation.

<sup>1</sup> Continued from *Science* of Dec. 2.