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.[1]

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 innocency 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.

[1] Continued from *Science* of Dec. 2.