

Some physicians may think it is not necessary for them to possess special knowledge in prescribing physical exercise for their patients; but no one will assume for a moment that he is worthy to be called an ophthalmologist, aurist, gynecologist or surgeon unless he has made an especial study of these branches.

Physical education has had a wonderful growth in the United States in the last decade and it is a pity that few physicians and gymnastic professors (so called) recognize the vast amount of knowledge required to fit one to be a specialist in physical culture. The benefits resulting from physical exercise correctly applied are beyond measure, and the tonic effect is much better than that of drugs. The specialist in physical culture should know the effects of every kind of exercise he prescribes, *i. e.*, whether the nervous system is to be affected chiefly or whether the muscular system, the respiratory apparatus or the bony framework is the part called upon to perform the major part of the work.

In addition the hygienic surroundings of children should be most carefully observed, and everything pertaining to their improvement should be most rigidly carried out.

Diet plays no small part in this respect and the food should be most nutritious, and easily digested. Under no conditions should any food be prescribed that will in any way tax the digestive functions; and in many cases the physician must insist that the diet shall consist of nothing but milk. Physical results are often negative when diet is overlooked, because the gastro-intestinal canal does not perform the digestive functions properly and the patient instead of being benefited by his exercise, as he should be, finds that disease, as for example dyspepsia, is the result. Care should be exercised by the specialist in physical culture in allowing a sufficient time to elapse, in these cases, between the time food is taken and the period at which exercise begins.

If exercise be indulged in too soon after eating, great injury may result because the digestive organs will not receive an amount of blood sufficient to supply the process of digestion completely, the result being that the food is incompletely oxidized in consequence of which many diseases arise.

Bathing is also very essential in reference to the hygienic care of children. Baths of one sort or another are productive of good or bad results according to the intelligence with which they are prescribed. There are few children for whom exactly the same kind of a bath may be prescribed. Their constitutions differ so widely that it is necessary when prescribing a bath to inquire very closely into their family history and regulate the kind and temperature of the bath accordingly.

It is also important to regulate the number of baths. In most cases one bath a day will be sufficient, yet in some cases a bath every other day or twice a week will suffice. The time spent in bathing is a factor needing the closest attention, because if these children are allowed to bathe or be bathed regardless of the length of time a chill, depression or shock, may be the result, and in consequence the nervous system may suffer greatly. The physician who makes a specialty of the physical development of children should be thoroughly posted on all matters pertaining to the different kinds of baths and to the method of prescribing them. A bath wrongly prescribed espec-

ially in the case of weak, delicate and diseased children is often as productive of injurious results as a drug given in an overdose.

Strict attention should be paid to the manner in which these children are dressed. Many parents dress their children according to the season of the year, no matter what the temperature of the weather may be, and in so doing a cold results which often leads to some bronchial or pulmonary trouble. If they would dress their children according to the temperature and not according to the season of the year these troubles would not occur.

Massage is another important topic in reference to the physical and hygienic care of children, being one of the best means the physician has for aiding him in the cure of these cases. The doctor should be so conversant with massage that he may prescribe the special kind of rubbing needed for each case. The man who is a masseur and not a doctor needs especially to be guided in rubbing these patients; yet if the physician be ignorant of the different technical ways of using massage how can he prescribe massage intelligently.

SOME OBSERVATIONS ON THE PRINCIPLES INVOLVED IN PROPHYLAXIS OR PREVENTION OF DISEASES IN GENERAL, AND OF PULMONARY TUBERCULOSIS IN PARTICULAR.

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Prophylaxis or preventive medicine is founded on the supposition that a large proportion of the important diseases that afflict the human race are preventable by judicious measures adopted for the purpose. Such measures must be directed toward the accomplishment of one or more of the following objects: 1. To prevent the development of the specific causes capable of inducing disease. 2. To destroy or neutralize such causes after they are developed and before they had excited active symptoms of disease. 3. To so increase the natural vital resistance of the living body that it successfully resists the action of the supposed causes of any form of disease; and 4, to interrupt contact or communication of the sick with the well. To be successful in the accomplishment of these important objects we must have reliable knowledge of the causes that produce disease, or at least the conditions and laws under which they are produced or propagated, and the vital or metabolic processes by which they are destroyed or expelled from the living body.

It has long been known that one group or class of specific causes of disease is developed only in the animal body while under the influence of the same causes. Such are the causes of the class of acute eruptive fevers, variola, varicella, scarlatina, rubeola, etc. Being evolved only in the bodies of the sick and eliminated through the various excretory processes in sufficient quantity to poison the immediate surrounding air and thereby communicate from individual to individual in confined atmosphere or by contact, they are very appropriately called contagious. Fortunately all the diseases arising from this class of causes are strictly self-limited in duration and very rarely attack the same individual more than once.

Another very important class of disease-producing

poisons is developed and propagated outside of the human body, chiefly in connection with organic impurities in the air, soil, water or food, and have until recently been called infections. The important diseases arising from this class of causes are periodic and continued fevers, yellow fever, plague, cholera, and other endemic and epidemic affections, which like the preceding class are self-limited in duration, but not like them self-protective against future attacks. Their propagation does not depend so much on present contact as on the sanitary or insanitary condition of the environment.

The exact difference between a contagious and an infectious disease may be thus illustrated: Though a case of smallpox be placed in a perfectly healthy neighborhood, supplied with pure air, good water and clean soil, the patient would communicate the disease to every individual who came in close contact with him, and had not been previously protected; while if a case of erysipelas, typhoid or yellow fever or cholera be conveyed into such a neighborhood, it would not communicate the disease to a single individual in the new locality, unless the case was confined in an unventilated and unclean room until the confined air became sufficiently impregnated with the excretions to develop new infectious matter. When this has taken place, other persons from a healthy neighborhood coming into such a room and breathing its atmosphere are liable to sicken with the same disease; and many such instances have been quoted as proofs of personal contagion, when they were only foci of infection.

It is in limiting the number and destructive effects of this class of acute diseases by removing the conditions by which the soil, water or air become infectious that sanitary work has conferred its greatest benefits upon mankind. And it is in discovering the individual pathogenic bacteria and their ptomains or toxalbumins in each infection, and the laws and conditions under which they develop and multiply, that modern chemic and microscopic research has achieved its most important results in adding to the resources of the healing art.

The infections of soil, water, air and household filth have been recognized for centuries, under the names of marsh miasms, idio-miasms, and epidemic constitutions, and many of the laws by which they have been governed. But it remained for the chemists and bacteriologists of the present day to discover, isolate and propagate the active infective agents concerned in many of the diseases of this class. Very naturally, with the discovery of each pathogenic germ and ptomain came first the idea of destroying it by specific medication, and we speedily became overwhelmed with antiseptics, germicides and antitoxins with which to fight the noxious agents after they were already doing their destructive work in the blood or tissues of the living body. Experience however, is fast demonstrating that this is commencing the fight too late to achieve the most important results; for when the pathogenic germs and toxins have already pervaded the system and established their morbid process, the administration of germicides and antitoxins is found to exert but a limited control over the progress of the disease, and does nothing toward removing the insanitary conditions of the soil, the water, the air and the household want of ventilation and cleanliness.

On the contrary, so far as the sanitarians have directed their efforts intelligently against the contam-

ination of the waters and soils of any country by excretory filth and decomposable vegetable and animal matter, and have enforced such domestic regulations as secured to the people personal and household cleanliness and free ventilation with pure air and good light, just so far have they destroyed the sources of infection, and lessened the prevalence and mortality from the whole class of infectious diseases. If any illustration of this is needed, we have only to compare England, with her sanitary officers in all her seaport cities, and even country districts, constantly waging a warfare against every species of water and soil contamination, and enforcing household cleanliness and ventilation, and year after year boldly defying the inroads of cholera, yellow fever, plague and other infectious diseases, without a recognized quarantine station on any part of her coasts, with her colonies in Asia, where almost every river, watercourse and well is so contaminated with filth that the greater part of the population may be said to eat, drink and even inhale their own excretions, and as a consequence the cholera, typhus, yellow fever and plague continue their destructive visitation from year to year.

A Haffkin with his anti-cholera vaccination may prevent a few thousand cases of cholera when an epidemic is prevailing, but he must repeat the same every year or at every return of the disease, so long as he does nothing to remove the sources of the infection. But let the soil and waters of India be purified and their future contamination guarded against with the same vigilance as they are in England, and they would have no further use for either anti-cholera vaccin or anti-plague serum.

Yet the chemists and bacteriologists are almost certain to call every toxic and pathogenic germ with which they are able to produce a disease by injection or inoculation a contagion, and the sanitarian readily falls into the same habit and calls every disease so produced *contagious*. It is on this line of investigation that the bacillus tuberculosis was discovered, and its reproduction in the sputum of the patients, and the idea of the *contagiousness* of phthisis was revived and proposed as the chief basis on which to found measures of prevention, by officially declaring the disease to be contagious and to be reported by physicians to the health authorities, as in the well known acute contagious and infectious diseases. But the wide disparity between the clinical history of the acute, self-limited, infectious diseases with the well-defined beginnings and terminations, and that of pulmonary tuberculosis or any other form of tubercular disease, with its obscure beginning, its duration through months and years, and its already diffusion in almost every township in Christendom, should cause every true sanitarian to hesitate long enough to scrutinize all sides of the subject before he decides to put smallpox, typhoid fever, cholera and tuberculosis under one and the same designation—*contagious*.

As previously remarked, one of the most important errors now common to both bacteriologists and sanitarians, is that of calling every disease *contagious* as soon as a specific germ is identified with its progress, and then directing their chief sanitary or preventive efforts toward the destruction of the germ. There is, however, a clear and very important practical distinction between the contagion that propagates acute disease wherever and whenever it comes in contact with an unprotected individual, and the specific microbes classified by M. Jaccoud (*Sem. Méd.*, January, 1897),

as etiologic dualisms, because they may exist in a healthy organism without injury to the latter for an indefinite period, and become noxious only in consequence of changes undergone by the organism itself.

The bacillus tuberculosis is the most familiar example of this class. It may be found in the upper air-passage of perfectly healthy individuals, in the air of dwellings, public conveyances, hospitals and in the dust of streets in almost every part of Christendom; and yet it displays its noxious effects in producing pulmonary tuberculosis in only a limited percentage of the population in any country. The only reasonable explanation is that given by Jaccoud when he says that with this class or group of microbes "pathogenesis by changes in the organism is the rule, and the traditional etiology based on heredity, congeniality, predisposition, constitution, temperament, or on somatic or cosmic influences retains all its force. These multiple and variable elements are the *true causes* of disease; the microbe is only the instrumental agent."

The truth of this statement is illustrated and confirmed by the clinical experience of the profession in all countries and through all the centuries, as could readily be shown by facts and figures, if time and space would permit. The truth is that the leucocytes and other elements of vital resistance in strictly healthy human bodies, surrounded by fairly good sanitary conditions, completely resist the influence of all the bacilli of tuberculosis to be found in the air or the dust, as the history of the Brompton Hospital for consumptives, and other hospitals in which tuberculous patients in every stage of advancement have been admitted and treated, clearly show. It is only when the natural vital resistance of the healthy living body has been impaired by persistent depressing mental influences, such as anxiety, despondency or grief, or by living in overcrowded, ill-ventilated houses on damp soils; or by insufficient food, clothing, and open air exercise; or by the use of alcoholic drinks and other anesthetic and narcotic drugs; or by prior attacks of other severe disease; or even hereditary defects of organization, that the tubercle bacillus is able to develop its destructive effects on the human subject. If this is true, the leading practicable principle of prevention is so to instruct the people that the various causes of vital impairment enumerated may be avoided.

To publicly declare tuberculosis a *contagious* disease, and require physicians to report to the health boards every case, with isolation of advanced cases, would deter large numbers from consulting a physician in the early stages of their disease, through fear of thus being reported; it would add greatly to the anxiety and despondency in families where a suspected case might exist, and would equally add to the difficulty of finding employment for such; and it would speedily lead to the erection of legal barriers in the way of changes in climate, thereby compelling the unfortunate consumptive, like the leper, to abide either in the isolation hospital or some colony on a strip of the public domain set apart for that purpose. In a word, it would be going back to repeat the sanitary treatment of consumptives practiced in Italy and Spain during the first quarter of the present century, and with very similar results.

Instead of thus directly adding to the fears, anxieties and miseries of all classes of the people, our sanitary authorities should with increased vigor, continue their work of enforcing everywhere cleanliness, house

ventilation, soil drainage, pure water, wholesome food and the discontinuance of the use of all varieties of alcoholic and other anesthetic drinks, which so invariably diminish nerve sensibility and vital resistance to morbid agencies. In so doing they will accomplish vastly more in limiting the spread or prevalence of tubercular consumption than by all other agencies combined. It is to work in these directions that we owe whatever improvement in the ratio of mortality which has taken place during the present century. Indeed, if we could effectually stop the use of all varieties of alcoholic drinks, and thereby do away with their depressing and paralyzing influence on the vital processes in living matter, with the poverty and mental wretchedness that ever accompanies their habitual use, before the end of the first quarter of the incoming century the prevalence and mortality from tubercular disease would have been diminished more than one-half.

PRESENT STATUS OF INOCULATION AGAINST YELLOW FEVER.

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The attention of the medical profession has been called anew to the preventive treatment of yellow fever by the claim of Giuseppe Sanarelli to have discovered its germ.

We find in the *Medical News* (January 27) the following notice: "A cable dispatch from Rio de Janeiro to the *London Times* states that a young Italian, Giuseppe Sanarelli by name, has undoubtedly discovered the yellow fever germ. Sanarelli is the director of the Uruguayan National Institute of Experimental Hygiene, and a follower of Pasteur. He is said to have sent an account of his discovery under seal to the Academy of Medicine at Rome."

There appears also in the *Medical Record* (April 24, 1897), the following allusion to this supposed discovery: "The Rome correspondent of the *Lancet* writes that Dr. Giuseppe Sanarelli, who believes that he has discovered the bacillus of yellow fever, as well as a remedy for the disease, has embodied his researches in a monograph which has for some time been in the possession of the Academia Medica di Roma, that body being thus empowered to protect his claim to priority should that claim in the interval have been challenged. The supplementary studies by which he has sought to check the laboratory and clinical work leading up to his discovery are now completed, and the whole series, including the substance of the monograph aforesaid, will be published in three successive numbers of the *Annali dell' Istituto Pasteur*. Coincidentally with the appearance of the first of these fasciculi, that is, within a few weeks' time, he will deliver before the Montevidean Society of Medicine a lecture, accompanied by illustrative preparations, in which the nature of his discovery and the successive stages by which it was arrived at will be fully set forth."

In connection with these announcements, I would ask attention to the following paragraph in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, headed "Prophylaxis of Yellow Fever in Brazil": "The disease was kept under control and stamped out in Buenos Ayres by the immediate removal of