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THE ANNUAL DISCOURSE.*

NOTE.—At an adjourned meeting of The Massachusetts Medical Society, held October 3, 1860, it was

Resolved, "That The Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

THE PHYSICAL EXAMINATION OF APPARENTLY HEALTHY INDIVIDUALS: ITS IMPORTANCE, LIMITATIONS AND OPPORTUNITIES.

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As a matter of custom it is usual to discuss health in terms of the opposite to health, that is, mortality, morbidity or defects. A community will boast of its health by exhibiting a low death rate, a low morbidity rate, or a scarcity of defects as found in the draft examinations.

At one stage in the world's history the avoidance of death was considered to be satisfactory evidence of health. Those were the days when epidemics and pestilences swept over the world and when people were anxious to expose themselves and their children to mild cases of a pestilence in the hope, often vain, that they might contract a mild form of the disease. In those days it hardly occurred to people that they might entirely escape a prevailing pestilence; the only thought was not to die of it. Of course there were certain individuals and certain groups of people that did not contract these great pestilences, but that did not seem to be within the realm of human wisdom to foresee or within human ability to achieve.

With the dawn of sanitary consciousness it began to be evident that illness was more than an act of Providence. Certain meager bits of information indicated that human agencies might be able to avert disease. For a long time these struggles were not particularly effective. Then more or less suddenly the nature of one great group of diseases, namely, the communicable diseases, became known, and with it came the hope of preventing all infectious diseases. This hope is still very far from being realized. Nevertheless, at the present time we do have sufficient knowledge to affect materially the ravages of certain infectious diseases. One may without undue rashness prophesy that the coming generation will, perhaps, see the end of certain of the now well-known infectious diseases. However, when we study, statistically, recent epidemics of influenza or of anterior pol-

*Read before the Massachusetts Medical Society, June 13, 1923.

iomyelitis or the endemic occurrence of pneumococcus pneumonia, we must appreciate our ignorance and impotence in some, at least, of the communicable diseases.

At the present time, our so-called civilized communities in the temperate zones have seemed to reach a nearly fixed level as far as mortality and morbidity rates are concerned. This level is in striking contrast to the rapid decline of these rates during the previous score or more years. There is, to be sure, a slight and definite improvement which can easily be detected, despite the fluctuations due to occasional interferences. The rapid improvement during the last part of the last century and the beginning of this century has been very largely in the avoidance of certain infections, most notably those spread by contaminated food and drink. The age period which has been most greatly benefited has been the age of infancy. Everywhere in the civilized world infant mortality has been tremendously reduced. It is the fashion to say that the reduction of infant mortality has been accompanied by an increase in the health problems of childhood because weak and puny infants now live to grow into rather delicate children. Our knowledge of the general processes of immunity, however, does not by any means entirely substantiate such a viewpoint, although there are certain data which may be regarded as supporting this assumption.

The civilized world of today, while continuing in a much more intensive fashion than ever before its battle against mortality and morbidity, is, in addition, directing its attention towards perfecting health. The present generation is no longer satisfied with the avoidance of death or with the prevention of disease. The public nowadays wants to enjoy the fullest possible measure of health. Not only is the safeguarding of health demanded, but the development of a state of better health is desired. The emphasis is being shifted from health, as a negative liability taken in the sense of freedom from illness, to health as a positive asset.

The physical examination in the ordinary state of one's health is taken to be one of the necessary foundation stones not only for disease prevention, but also for health development in this positive sense. It is obvious that the physical examination, a stock-taking, as it were, must be an essential preliminary to intelligent action in health development.

It has long been known that much could be learned concerning the human body by physical examination. It was certain a number of defects discovered at physical examination could be corrected. Almost at once a great wave of enthusiasm for physical examination appeared. Great things were predicted of the periodic physical examination. It was felt that life could be very definitely prolonged, since defects, which if neglected, might well be fatal, would be brought to light by these examinations and would be cured.

It was, furthermore, hoped as a natural result of physical examination, and particularly of repeated physical examinations, that directions for changes in habits of living might be available for those really interested in their health.

It was believed that the course of most chronic diseases might well be altered and life prolonged, provided there was early recognition. In favor of this view, there was considerable medical authority. Dr. Oliver Wendell Holmes of Boston had maintained with logic and humor the tenet that if one desired to live to be old, it was usually necessary to acquire a chronic and incurable disease, in consequence of which the individual so afflicted took care of himself and proceeded to outlive the well members of his family who were not so fortunately afflicted. Sir William Osler, then of Baltimore, had somewhat the same thought when he said in his picturesque fashion that a man was indeed fortunate who discovered at fifty that he had a trace of albumen in his urine. The public at large has taken very kindly to such ideas. It is a very popular form of humor to refer to a Chinese tradition, which does not seem to be really well authenticated, at least not in as far as the application is concerned, that the prime function of a physician is to maintain health, and that an illness should cause the physician to lose not only his position as attending physician, but also his head.

While the medical profession and the laity have taken up with enthusiasm the idea of periodic physical examination in health, nevertheless somehow in the application of this idea there is usually a sense of disappointment. There is often the feeling on the part of both the examiner and the examined that the positive results of the examination are, somehow, inadequate. Too often the favorite symptom remains somewhat of a mystery, at least as far as explicit advice concerning remedial measures is an index of the ability of the examiner to solve it.

Experience has shown that the physical examination, even if frequently repeated by competent men, may yet fail to disclose positively every disease in its earliest stages. It is one matter to reconstruct at the post-mortem table, the development of a disease, with its symptomatology, and quite another matter to do the same thing in advance. Those symptoms which seem so illuminating in retrospect are often quite insignificant in the early stages. Again, the inroads of certain progressive chronic diseases are often quite uninfluenced by any therapeutic measures with which we are now familiar. It is disconcerting that we must accept, for example, that the first symptom or sign of certain cases of malignant disease is the appearance of a metastasis.

Furthermore, in the state of our present

knowledge, it must be accepted that the prevention of certain infectious diseases is not within the powers of the present-day sanitary knowledge under the usual circumstances of social environment. Individuals coming for physical examination and the requisite advice concerning the prevention of "colds" and influenza, for example, can, of course, be given important general directions. It is unsafe, however, to give individuals, either singly or as a group, any positive assurance that they can by the adoption of any known precautions, be certain to escape these infections, provided their activities mingle with those of the general community.

It is perhaps on account of the extravagant claims made for the results of physical examinations that certain of these examinations have furnished results which have seemed so inadequate and so disappointing. It is obviously desirable that such a valuable procedure should not be put into disrepute merely because the results are very definitely limited in their scope. Unless the precise situation is carefully explained to the individuals examined and to those persons who are instrumental in arranging the examination of large groups, there will be just cause for dissatisfaction. In this connection, it seems to me always important to emphasize the fact that the physical examination has a value beside that of being the starting point for the correction of discovered defects. In the first place, the physical examination is of very great value in the instruction it gives in rules of health to all of those who are examined. That should be an important feature of the physical examination. The ideal method of health instruction is the individual instruction between doctor and patient. In the second place, the physical examination is perhaps just as important in ridding a person of notions that they have defects, as it is in discovering the defects which are unknown to the individual. On the whole, our experience at Harvard University leads us to think that perhaps physical examination may often do the greatest good in establishing the fact that the individual is entirely sound. Human nature would seem to be such that most people take kindly to the idea that they have a serious ailment. One has only to listen to the conversation of patients in any hospital to be convinced that the patient who can boast of the most serious disease and the most serious complications is, on the whole, the most admired of the group. After all, the success of quackery depends largely upon convincing a well person that he or she is ill. Subsequent recovery and the testimonial which is so essential to the existence of quackery naturally follow, if the individual has never actually had a disease. In my opinion, more emphasis might be placed on the value of physical examinations in determining that people are actually healthy, and less emphasis might be placed on the certainty of discovering defects, with the assurance that these defects can be corrected.

Additional experience with physical examinations has disclosed other factors which have been the source of dissatisfaction and confusion. There is as yet no general agreement as to what constitutes a normal individual. Our standards of health have been erected entirely on the foundation of the physicians' findings in sick people.

Physicians were formerly only consulted when the patient had symptoms. Physicians associated the signs discovered by physical examination with those symptoms. It was natural enough to go one step further and conclude that the same signs in the well tended eventually to be associated with the symptoms of manifest disease. But continued experience does not indicate that such a generalization is always safe. For example, there are among the cardiac irregularities certain types which are quite consistent with a normal heart. Then, too, an elevated blood pressure may be transitory or, even if persistent, may not be incompatible with years of well being. Furthermore, in consequence of the deductions from the angle of the sick individual, the importance of certain defects has been distorted. The relation of decayed teeth to indigestion or arthritis is unquestioned in certain individuals. But the freedom from such symptoms of large numbers of people with decayed teeth is illuminating and should correct the perspective of even the more militant crusaders of dental hygiene.

The early attempts to get data based on the examination of large groups of individuals disclose the need of a health standard. The statistics of physical examinations of large groups of individuals are often startling. For example, it is maintained that 80 per cent. of the school children of a very large State presented some form of defect. In analyzing these defects it was found that the presence or absence of defects was determined by the particular standard which was adopted. An absent tooth, a slightly decayed tooth, tonsils that did not entirely please the examiner, too little or too great weight for the height and age, etc., etc., were often reported as defects.

The country as a whole was considerably alarmed by the figures of the physical examinations of the draft, which showed that nearly 40 per cent. of individuals were rejected for army service on account of physical defects. That was, indeed, a very sad indictment of the young manhood of this country, when 40 per cent. of them were found unfit to bear arms in defense of their country. These figures, however, bring out the point that for the army a particular standard is adopted, which does not necessarily apply to every industry in the country. Some of us who had to do with the examination of recruits for the army, particularly in the early days, recall with exasperation the frequent changes in the standards of eye examination,

for example. Doubtless it has a good deal to commend it, that a soldier should have good eyesight in both eyes without the aid of glasses. Nevertheless, he may be entirely fit for many occupations provided his bad eyesight is corrected by suitable glasses. In the old army examination varicocele was a cause for rejection. The experience of the British and French armies showed that the physical standard could be safely considerably lowered without seriously impairing the physical efficiency of the army as a whole. Of course there are other considerations concerning physical examinations for the army. The country is now burdened with the care of men who were admitted to the army with existing defects, which were either not discovered or passed by. It is a fact that a soldier with a defect may ignore or hide a defect at home with the enthusiasm of enlisting, but he has also been known to demonstrate the same defect with vociferousness when he did not feel like carrying out some particularly disagreeable or dangerous duty. The same defect may be affectionately treasured as an important financial asset at the time of discharge.

From the foregoing I trust that it is evident that statistical data derived from physical examinations must be interpreted in the light of the arbitrary standards which are used, and, furthermore, that there may be complicating factors, such as pensions in the army, as an example, which need consideration in the adoption of a standard of physical fitness for a given occupation.

There are certain defects, of course, which are manifest and which are accepted by all medical authorities. I mean such defects as well-marked heart disease, well-marked tuberculosis, protruding hernia, and the like. There are also certain cases in which there would be very marked disagreement as to the presence or absence of these same defects. If we add together all of the defects which would be reasonably certainly accepted as the evidence of organic disease, we find only a small percentage. In the figures which I have collected for students at Harvard College the incidence of undoubted organic disease is under 5 per cent. Heart disease is under 2 per cent. It may be argued that the Harvard College student is not a fair sample of the country at large; nevertheless, the analysis of other figures at this age do not show any great change. In any event, the amount of disease or defects which can be accepted as organic is not considerable.

These figures, of course, do not include the defects of the eye which are corrected. Our figures indicate that about 40 per cent. of young men in occupations requiring an intensive use of the eyes need glasses. Some 38 per cent. of Harvard freshmen already wear glasses, and after four years of college work the percentage is 42 per cent. The additional small percentage is represented by minor refractive errors which do not require correction unless associated with symptoms according to the present ophthalmologic doctrine.

Our examiners at Harvard University find little trouble with the teeth. The dental propaganda seems fairly effective. While we do find individual instances of neglected teeth, or perhaps more frequently, instances of neglected individual teeth, yet teeth as a whole are fairly well cared for in most of our communities. This statement may not go unchallenged. At the present moment teeth are a controversial topic, and one finds it extraordinarily difficult to reconcile the following evidence with certain extreme views that so many ailments are traceable to pathological conditions in or around the teeth. The British Tommy, for example, got along with no tooth brush, and with very few teeth, which were mostly decayed as well as neglected. It was not apparent that the British Tommy had many more of the ailments that are ascribed to teeth than the average American doughboy with his well-kept teeth.

There are only a few students at Harvard University who have obviously badly diseased tonsils. It is extremely difficult or impossible to fix the borderline between diseased and normal tonsils. Fifty per cent. of the students who come to Harvard College have had some sort of operation on their tonsils. That there are not left many cases still requiring operation is further attested to by the fact that tonsillectomy is relatively uncommon during the subsequent course of these students. Certainly here we find evidence of the extraordinary effectiveness of popular educational measures concerning tonsils. It is a question, that I do not believe can be answered at the present time, whether perhaps the pendulum has not swung too far in the promiscuous removal of tonsils. On the one hand, one has the extraordinary fact that every other boy in the last two freshman classes at Harvard was subjected to an operation to remedy some supposed defect found by physical examination. On the other hand, physicians know only too well the organic complications of diseased tonsils.

In the examples of data derived from the examination of the eyes, teeth and tonsils, one finds illustrated some of the reasons for confusion in interpreting the results of physical examinations. Certainly the perfect pair of eyes, the perfect set of teeth, and the perfect nasopharynx are rarities. It is also certain that in the existing environment a goodly proportion of individuals need glasses, dentistry, and tonsillectomy. What those proportions are, and how closely they should approach 100 per cent., is still a mooted question. Yet the standards of physical examination of these organs depend on an answer to this question. At present the attempted answer must be confessedly arbitrary and will be bound to vary within wide limits.

One could go through each item of a physical

examination and illustrate a lack of standard with each item. I will, however, take time to discuss briefly two items concerning which we can, perhaps, speak with some definiteness. Certain medical examiners are very prone to find so-called "heart disease," and they base their diagnosis of heart disease on the presence of murmurs or of irregularities. We have at the present time instruments of precision which, while not infallible, yet greatly assist us in differentiating organic disease from functional disturbance of the heart. These instruments of precision, taken with continued experience, show that murmurs and irregularities are not necessarily evidence of an organic heart disease. As a matter of fact, such cardiac symptoms as shortness of breath, precordial pain, inability to perform any considerable effort, even when associated with a constantly rapid pulse, may not be certain evidence of organic heart disease. In the recent war attention was focussed once more on a condition described by Da Costa as "soldier's heart." This condition was designated as "effort syndrome" in the last war, and the general consensus of opinion was that the heart was not organically damaged, and that the disturbance was in the central nervous system. These cases are actually prevented by their disabling symptoms from taking strenuous exercise. They are not fit, but the disturbance seems to be a functional one and does not seem to be associated with organic changes in the heart itself. We have found in our work at Harvard University instances of this sort repeatedly. As a rule, the case presented comes on account of difficulty in participating in athletics, inasmuch as with ordinary exertion the mild and common cases of "effort syndrome" present no symptoms.

An investigation is now under way in which we attempt to bring out definite systolic murmurs in presumably normal hearts. We find that in the recumbent position after strong expiration, 70 per cent. of unselected normal individuals will present a definite systolic murmur, usually at the pulmonic area, occasionally at the apex. This murmur is not ordinarily transmitted. This murmur may be found in athletes, but it is of interest that it is not found in a group selected for unusual physical and athletic prowess. Owing to an inadequate understanding of "effort syndrome" and of the significance of systolic murmurs and of cardiac irregularities many individuals are now improperly recorded as having organic valvular heart disease. It is much more than a scientific quibble to insist on this point, since the presence or absence of an organic heart lesion may determine in many individuals the trend of their subsequent careers. Furthermore, such erroneous diagnoses, often accompanied by extreme advice concerning the dangers attendant on heart disease, result in more or less justifiable doubts in regard to the value of physical examinations when a subsequent correction of the diagnosis is made. On this particular point, Sir James Mackenzie speaks with feeling and emphasis. Of course mistakes and errors in judgment will always occur, but unless physical examinations are to be discredited, all available scientific data must be utilized for such an important decision as the presence or absence of organic heart disease.

In our attempt to create a standard of health in the particular group under our supervision at Harvard University we have studied albuminuria in young men. Albumen in the urine was formerly regarded as almost certain evidence of Bright's disease. With the examination of large groups of people it was disclosed that albuminuria occurred not infrequently among young people as a temporary finding. In our examinations we found albumen in about 6 per cent. of our young men. Some of these cases have been followed for a number of years, and we are unable to trace any relation between the presence of albumen in the urine and organic disease of the kidneys. There are occasionally cases of kidney disease, but these cases are readily diagnosticated by the usual criteria. It is of considerable interest, however, that albuminuria is rarely found in those young men who are endowed with splendid physique. Furthermore, a persistent albuminuria of the orthostatic variety, that is to say albuminuria which is only absent when the individual is quiet in bed, is apparently usually associated with a very poor posture. It is well known that albuminuria can probably be produced in any normal individual by prolonged severe exertion. A reasonable explanation of functional orthostatic albuminuria would seem to be that in certain individuals albuminuria appeared at a very much lower level of physical activity, namely, the trifling activity of the daily occupation without violent exertion.

It is, perhaps, largely on account of this lack of defined standards of health that physical examinations have not yielded the results so confidently expected of them. If we take the fixed standard of certain organic pathology, one will find, as we have stated, that the percentage of actual organic defects is very low, probably in the age group such as in college about 5 per cent. If, on the other hand, we accept as a standard any deviation from an arbitrary fixed normal function, and include as defects such findings as albuminuria, systolic murmurs, etc., it is very easy to push the percentage of defects, not only as high as 80 per cent., a figure which was attained in school children, but above 90 per cent. On account of these wide discrepancies much confusion has naturally resulted. Even when refractive errors of the eye are corrected, all tonsils are removed, all cavities in teeth are filled, and all other remedial defects are remedied, some examiners will find still over 90 per cent. of deviations from an arbi-

trary normal, while other examiners will find only the small percentage of organic defects.

Furthermore, it will be true that certain individuals who have some slight organic defect, even such as a slight cardiac lesion, will be not only more useful but more active citizens than those who are apparently entirely free from defects. After all, next to life, activity is the essential of the human machine. A so-called defect, particularly if it is not a blemish, is of only academic interest if it is without effect on life, activity, and well-being.

What it is actually important to know is how the individual as a whole can undertake the affairs of life, rather than to befog the issue with an array of defects which, although permanent, may in nowise interfere with his future career of usefulness. This situation has led to various attempts to devise tests of function or of physical efficiency. In the olden days the physical efficiency test was some form of personal combat in which the better man emerged victorious. It soon became evident, however, that there were limitations to such a method of evaluation of human physical efficiency, inasmuch as one man might easily excel in one form of contest, and his opponent might excel in others. It was often evident that superiority was more a matter of training and coaching than of physical efficiency. In the present days I think no one ventures to offer as a test of general physical efficiency any one contest, as example, the distance a man can leap, or how fast he can run, or how well he can box. Of course, various combinations of these contests have been arranged, but they have not been accepted as of very great value. At one time various anthropometric measurements were suggested as the criteria of physical efficiency. These measurements were not particularly valuable, especially when taken alone, because they did not take into consideration the presence of possible organic defects discoverable by the usual physical examination. Out of the physical measurements there developed attempts to evaluate physical efficiency by different kinds of strength tests. These, in turn, have largely been discarded, because they take into consideration only the factor of muscular strength, and, furthermore, it was soon found that a little practice introduced too great a divergence in the readings.

More recently certain specialized physical efficiency tests have been developed, which have given good results, particularly in the hands of their advocates. As a rule, these physical efficiency tests have been applied to the cardiovascular system, and have largely depended upon the variations in blood pressure and pulse rate before and after exercise, etc. There has been a serious complication in these tests because of the absence of any known standard of normality and because the test did not precisely parallel the kind of work for which the individual was being tested. In the case of aviators during the war, it was possible to build up a physical efficiency test which did reproduce to a reasonable degree the conditions under which the aviators had to work, and which proved, on the whole, a very satisfactory test for fitness for aviation.

It must also be remembered that the more closely one reproduces the precise conditions of a given industry, the more nearly is one approaching the employment of performance in the industry as a test. In other words, one can always speak with authority concerning the safety of ice for skating if someone has tried the ice, particularly if he has fallen in. While there will be unquestionably various tests in the future which may be applied to certain specialized industries, thus far no really satisfactory test has been devised which will evaluate in general terms a given individual's physical efficiency.

The desired test ought to be sufficient to enable us to classify, roughly at least, individuals so that one could select those who are suited for general types of activities. Such a test should supplement and not replace the physical examination, and should enable us to give some answer as to why individuals who are organically sound are apparently unable to undertake certain ordinary forms of work.

I have already tried to show in the discussion of standards of physical examination that certain abnormal findings do not necessarily indicate the presence of organic disease. Frequently these abnormal findings are to be interpreted as disturbances of functions, which are usually of no significance as far as life is concerned, but which may, however, be of some importance as regards perfect well-being and actual physical capability. It has seemed to us that it might be possible to develop out of the data obtained by a complete physical examination certain information which could be interpreted in terms of actual physical efficiency. The addition of certain evidence obtained by history or special methods of examination might, of course, be necessary. Consequently we have in the past few years made certain slight additions to our physical examinations, which, however, have still been kept within the time requirements that are so essential in the examination of large groups.

The functional efficiency of individuals is obviously divided into two portions, the physical and the nervous. I use the term nervous with great reluctance, but find that that term is, on the whole, more expressive than any other term or combination of terms. While in many ways it is desirable to separate the purely physical and the purely nervous functions, it is important to appreciate how closely they are related. I have previously given an illustration, namely the "effort syndrome," in which the symptoms are very largely and sometimes exclusively cardiac, and yet the causative disturbance is in the nervous system.

We assume that an individual has a certain intellect, which is the product of his heredity as modified by environment and training. The ability to use to the utmost this intellect, in case the individual is a mental worker, depends, somewhat, at least, upon the functional capacity of his body, perhaps more definitely upon his nervous stability, which, in turn, is affected considerably by his physical well-being.

As an addition to the physical examination which we employ at Harvard University, we have a simple but, on the whole, rather satisfactory method of classifying the way the individuals use their bodies and their feet. We designate this as the mechanical use of the body, and have arbitrary classifications of A, B, C and D. It is of some interest that according to this classification approximately 20 per cent. of college freshmen have good mechanical use of their body, and about 80 per cent. have bad mechanical use of the body. Of that 80 per cent, 35 per cent. have very bad mechanical use of the body. Individuals with poor posture probably ought not to be classified as having defects, and certainly not as having organic defects. As a matter of fact, these percentages represent merely habits of mechanical usage. These habits are relatively more or less firmly fixed at that age, depending upon the individual. We find that a considerable portion of individuals tend to correct their bad use of the body, particularly with instruction. In other words, ordinary growth, development and usage help correct habits in some instances. On the other hand, another group of individuals will change from fairly good use of the body to poor use of the body in a similar period of time. The relation of poor posture to general well-being is by no means settled. One is often much in doubt as to whether the individual is sick and assumes a bad posture or is sick because he assumes a bad posture. However, there are certain evidences, such as orthostatic albuminuria, which are suggestive of some association between poor mechanical use of the body and a disturbed function of other organs. Poor mechanical use of the body is associated with, even if it does not explain, many disturbances of a minor character. Furthermore, we find that there is a close but not exact parallelism between mechanical use of the body and athletic achievement, and, also, surprising though it may seem, the intelligence tests in one of the Graduate Schools of the University. Let me hasten to correct any misapprehension. I am not advocating this classification of the mechanical use of the body as a functional test of the individual as a whole. I merely want to suggest that such a functional test of one item of bodily function may be one of the several criteria which, taken all together, may give us some picture of the functional capacity of an individual as a whole. I dwell on this single functional classification, first because it has been thoroughly worked out, secondly because it may serve as an illustration of other systems of the body, and thirdly because already in our investigations, as has already been indicated, we find a marked tendency for the association of multiple functional disturbances. One might include, either separately or as a part of the mechanical use of the body, some classification of the sheer muscular strength of the individuals. If any place is to be found for such a classification it will probably be an insignificant one.

As has been already discussed, albuminuria in young men, without other signs of nephritis, is not to be regarded as evidence of organic disease. Albuminuria may well be taken as one of the criteria by which is indicated a disturbed function, the exact nature of which is not understood. One sees in this finding the same tendency for the association of these functional disturbances, or at least disturbances without an organic basis within our present comprehension.

It is possible to take each physiological system in turn and scrutinize the findings already available in any complete physical examination, not only for the presence or absence of organic disease but also for disturbances of a functional nature. For example, the presence of a sytolic murmur, as already indicated, does not mean a damaged heart. On the other hand, in our study of men with systolic murmurs, we did not find conspicuous athletes who had a murmur. We are inclined to interpret the presence of a systolic murmur as indicating a deviation from the best physical condition, but of no organic significance. Here, again, it was notable that in the men that we examined, there was an association between these insignificant systolic murmurs and other findings, such as unstable blood pressure, albuminuria, etc.

In our study of variations of blood pressure, which has not progressed as far as certain other studies, we have been much impressed with the frequency with which a blood pressure over 140 could be demonstrated. In one series in which the blood pressure was taken, both in the standing and in the recumbent position, approximately 20 per cent. of the individuals gave a reading of 140 or over in one of the determinations. Subsequent examinations demonstrated the fact that this reading was only temporary, and I do not think that anyone would maintain that these individuals suffered from any organic pathology of the cardiovascular system. On the other hand, the existence of an unstable blood pressure may be interpreted as we have interpreted other derangements, as indicating a sub-standard, even if not an abnormal state of physical efficiency.

Much has recently been written in regard to under-nutrition and over-nutrition. In the schools much has been made of rather large numbers of so-called under-nourished children, because they did not conform to a somewhat fixed arbitrary standard of weight for their

functional derangements to be associated in the same individual; for example, a man given a poor classification, which we arbitrarily designate as D, in bodily mechanics, will also have albuminuria, a tachycardia, an unstable blood pressure, and perhaps sinus arrhythmia, and finally nervous instability of a certain degree. Such an individual may be in the ordinary medical sense, organically sound, and may have his normal expectancy of life, but he has such an accumulation of associated functional derangements that it will seem legitimate to regard him as below par, not at present likely to enjoy robust health or fit for activities requiring unusual strain. On the other hand, one may find individuals who may have only one of these many functional derangements and they may be regarded as below par in only one respect. Such a method of classification and evaluation is of course not now in actual operation. The outline of this plan has been slowly built up and is only now being crystallized into definite shape. But our experience lends some confidence in the possibilities of the plan as outlined.

It has not been my intent to outline any particular plan for physical examination which I want personally to advocate. Rather it is my intent while emphasizing the importance of an adequate physical examination to indicate that the physical examination as now ordinarily carried out and interpreted, does not meet the requirement of the situation for a variety of reasons. An adequate physical examination must fulfill three important purposes: (1) The detection of organic pathology, to be followed by the necessary measures for the correction, compensation or control of the lesions discovered, as far as possible. (2) The detection of non-organic functional disturbances, to be followed by the necessary measures for the correction, compensation, or control of these disturbances, as far as possible. (3) The evaluation and classification of each individual as an entity, to be followed by directions as to suitable future activities and by measures designed to better his classification and thereby improve his well-being and enlarge his potential activities. At the present time it is customary to regard the beneficial effects of certain physical habits of eating, sleeping, exercise, etc., as axiomatic. And there are many individual illustrations of the validity of this custom, for example in the treatment of tuberculosis, psychoneurosis and sundry other chronic ailments, both organic and functional. If, however, it were possible to evaluate these and the many other enthusiastically recommended procedures by demonstrated alterations in the physical examination, at once personal hygiene could be taught not with apologies to one's conscience and to science, but with sincerity and effectiveness.

Original Articles.

EARLY DIAGNOSIS OF THE MORE COMMON UPPER ABDOMINAL CONDITIONS.*

BY JOHN B. DEAVER, M.D., PHILADELPHIA, PA.

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In discussing the early diagnosis of upper abdominal conditions I fear I cannot present anything very new, and with the old you are all no doubt more or less familiar. Nevertheless, it is a pleasure for me to be with you this evening and to attempt to interest you in the point of view of the questions I will touch upon. It is generally agreed that most of our recent or new knowledge of diseases of the upper abdomen has been the work of the surgeon who has told us what he has learned about the pathology of intra-abdominal disease by his numerous autopsies *in vivo*. It also is no doubt true that in no other way, except in the post-mortem chamber, but where the tissues are seen and examined, not in their living state, but only in the terminal stage of disease, can the same concept be obtained as by study on the living subject.

For want of time I shall only touch upon the more common upper abdominal conditions, those occurring in daily practice. Changing the title of my remarks from diagnosis of upper abdominal conditions to early diagnosis of the more common diseases of the upper abdominal viscera, will, I think, give you a better idea of what I wish to convey to you. By diseases of the upper abdominal viscera we generally mean disease of the biliary passages, the liver, the duodenum, the stomach, the pancreas and the spleen; if we consider the upper abdomen as including the viscera above the umbilical line we might also include disease of the kidney, the suprarenals, the transverse colon as well as the retroperitoneal glands of this region, but these will not enter into our discussion this evening.

While early diagnosis—finding out what ails the patient while the pathology is in its infancy or in its formative stage—is the ideal for which we are continually striving, we must admit that it is not always possible. But as Moynihan has said: "There are few things that cannot be conquered if a man's heart is set on victory." So let us try to bring out certain points along lines which may help us all in more frequently making an early diagnosis of disease of the upper abdomen.

In this discussion we must not lose sight of the fact that many of the symptoms of disorders in this region may be and at times are caused

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height and age. It is certainly open to question what standard we should accept in estimating the normal weight. Certainly in school children any standard that does not take into consideration the factors of race and heredity, as well as the age and height, and perhaps the sitting height as opposed to the total height, is open to criticism. That there is a point of some value in the general consideration of weight is shown by various life insurance figures which, although crude, indicate that the nutritional state as shown by the weight, is a factor in determining the expectancy of life. Of particular interest is the apparent relation of over-weight to a shortened expectancy of life. It should be possible to interpret within the limits of each age group the general findings in regard to nutrition very much as the other findings which we have discussed have been interpreted. As in the other physiological systems which we have already discussed, it is hardly possible to separate too precisely one system from another, because all of these systems influence each other.

Perhaps of greatest importance is some classification of the nervous system, because the nervous system is so intimately connected with all bodily processes. Indeed, it seems likely that many of the functional derangements which we have already discussed, are more closely related to the nervous system than they are to the system with which they are apparently connected—for example, unstable blood pressure, the "effort syndrome," are apparently more closely related to the nervous system than they are to the cardio-vascular system. We have made at Harvard University some attempt to survey and scrutinize the nervous system much as we have surveyed and classified the bodily mechanics and the cardio-vascular systems of the individuals whom we examined. So far we have not succeeded in securing data with which we were particularly satisfied. This is peculiarly unfortunate since in the last analysis the general efficiency of the individual is perhaps more closely related to the efficiency of his nervous system than to anything else. Nevertheless, in spite of the difficulties, a beginning has been made. We have of course entirely eliminated the investigation of the intelligence, because that is a field of itself. That field can be reasonably covered with the methods of examination that we now have, even if no method is entirely fair or entirely satisfactory. The written examination, the oral examination, and even the so-called intelligence examinations, are all open to justifiable criticism, but all these examinations are unfortunately more satisfactory than the examination of the actual physical well being of the individual. In our attempt to establish some criterion of the nervous stability or instability of a given individual, we have relied upon two methods of examination. One, the method of questionnaire, which is in effect a condensation and modification of the familiar psychological examination, and the other the further interpretation of the usual findings in the ordinary physical examination. As has been noted above, the unstable blood pressure is probably related to some form of deranged debility of the nervous system. The same is true of sinus arrhythmia of the heart and tachycardia. Hyperactive reflexes, dilated pupils and the cutaneous manifestations of vasomotor disturbance are also data of significance. Tics, speech defects and numerous disturbances noted in a careful history represent additional valuable data. While we have collected a considerable mass of material, we have not the temerity at the present time to set up even a tentative arbitrary standard. Of course in individual cases one can safely designate the extreme instances of stable or unstable function of the nervous system. But to be really valuable a standard must be applied to the rank and file. It is at present our definite impression that a just estimation of the nervous stability of an individual is, in the absence of certain organic pathology, the most important factor in determining the individual's fitness for the essential activities of life. While an equanimity of the spirit is doubtless conducive to longevity, even if it is not as important a factor as long-lived ancestors and probably other factors, it is not certain that nervous instability actually shortens life. On the other hand it is certain from the observations of every one, I believe, that nervous instability of any considerable degree frequently interferes seriously with well-being and not uncommonly with successful achievement in life. At present the individuals with well marked nervous instability, perhaps inherited, are compelled in the absence of satisfactory functional tests to undergo the tests of actual performance. If they fail in this acid-test, one explains the failure by well intentioned phrases as "nervous," "delicate," "timid," "temperamental," or perhaps by uglier terms as "cowardly," "useless." It is certainly one of the greatest opportunities in the application of physical examinations to classify individuals in regard to nervous stability. The detection of early and mild cases of nervous instability would result in the application of suitable remedial measures from which one might confidently expect excellent results. Furthermore it would enable the physical examination to record the limitations of individuals in regard to complete well-being and in regard to the essential activities of life. The physical examination would thereby approach more nearly the results now expected but not now attained.

But the standard which is to be adopted for a functional test for nervous stability, important though it is, is not to be regarded as the test for the individual as a whole. All the data which I have indicated will be taken together and summarized. It will probably be evident that there is a very strong tendency for these