A DISCUSSION OF CLASSIFICATIONS IN TUBERCULOSIS: THE ANATOMIC VERSUS THE PHYSIOLOGIC CONCEPTION*

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The development of medicine during the past half century has been along lines which have accentuated the anatomic idea. Anatomy, histology, macroscopic and microscopic pathology have dominated the field. Normal and pathologic cells and normal and pathologic groups of cells as we find them in organs have been the object of investigation. Form and structure have been given a place of greater importance than function.

This character of study has completely dominated medical discussions. In medical societies papers and discussions have been classified and rated very much according to their treatment of the pathologic changes in the tissues involved. A feeling of satisfaction has always followed the presentation of a specimen or a microscopic slide showing anatomic change. The changes in function, however, which are represented by the symptoms and constitute the pathologic physiology of the case are often, in fact, usually, hurriedly and inadequately described; and rarely is any attempt made to explain the manner of their causation. Regardless of the fact that diagnosis depends largely upon the recognition of disturbance of function and the fact that it is disturbance of function which usually causes the patient to consult the physician and the further fact that the restoration of function is the chief purpose of therapy, this phase of medicine has been but illy considered.

This anatomic conception has led to the magnification of the organ as a structure rather than as a functioning group of cells, influencing and being influenced by other organs through the nerves and internal secretions. Size, position and pathologic change in cells and organs has meant more than function. It has further led to the grouping of specialties according to the organ involved. These conceptions of disease are extremely narrow. Tonsillitis is only accidently a disease of the tonsil. In reality it is an infection produced by a microorganism which in this particular instance happens to be in the tonsil; but because of its location its treatment is assumed by the throat specialist. The same germ in the ear calls for an otologist; in the heart for a cardiologist; in the lung for

* Read by title.

a lung specialist: in the appendix for a surgeon; in the joint for an internist. Pneumonia and typhoid fever are not diseases confined to the lung on the one hand and the intestines on the other. Both are general infections; but we have not learned to think of them in that way. So is tuberculosis a general infection which locates now in the lung, now in the kidney, joint or some other structure. Its intelligent treatment calls for an internist who has a broad grasp of the human body.

Disease affects anatomic structure and converts it into pathologic structure. This change is not of serious import, unless it is accompanied by altered function, either local or in other parts of the organism. The various changes in function which accompany disease are recognized as symptoms; and, taken together make up the picture by which the disease is known and recognized. Anatomic change may be very extensive and yet not be serious; but, if it produces marked disturbance in function, it may become a menace to the organism no matter whether the anatomic extent be great or small.

An anatomic conception of disease affords a very poor basis for prognosis. A physiologic conception, on the other hand, affords a picture of the manner in which the organism is reacting toward the disease and gives a better basis upon which to make a prognosis. A broad view of medicine, however, can only be attained by a combination of these two conceptions.

In tuberculosis, we have been guided and bound by the anatomic conception. We have classified the disease into stages marked by arbitrary boundaries. Every classification has been, at bottom, an anatomic one.

The classification of Turban into first, second and third stages, according to the extent of the lesion has been accepted and made the basis of all adopted classifications. While it has been modified, yet it seems impossible to get away from it.

Turban's[1] original classification was as follows:

Stage I. Slight lesion not to exceed one lobe in extent.

Stage II. Slight lesion not to exceed two lobes in extent, or if a more serious lesion, not to exceed one lobe in extent.

Stage III. All lesions more extensive than those of Stage II.

In discussing this classification before the First International Conference on Tuberculosis, in Berlin in 1902, Turban[2] said: "I have shown that the prognosis of pulmonary tuberculosis is not dependent so much upon any other factor as *its degree of spreading* in the lungs." And in explanation of the terms used he said:

"As a *slight* lesion is to be understood disseminated nodules which are recognized on physical examination by slight impairment of the percussion note, rough, weakened vesicular, vesiculobronchial or bronchovesicular breathing, and fine and medium râles; as a *severe lesion* is to be understood dense infiltration and cavity which are to be recognised by dullness or tympanitic percussion note, weak bronchovesicular, bronchial or amphoric breath sounds, and medium or large or metallic râles. Slight pleuritic dullness is to be left out of account, but when it is

extensive it is to be considered as a complication. The 'volume of one lobe' is the same as 'two half lobes.' Slight changes in breath sound without percussion changes and râles are not to be considered."

At the Sixth International Conference held in Vienna in 1907, the Turban-Gerhardt Classification as followed by the Imperial German Board of Health,[8] was adopted. This follows the same anatomic scheme as suggested by Turban but lessens the amount of involvement for the various stages and modifies and clarifies the descriptions in certain respects as follows:

Classification Turban-Gerhardt (Imperial German Board of Health):
R-right. L-left.

I. Disease of slight severity, limited to small areas of one lobe, in case of affection of both apices the disease does not extend beyond the spine of the scapula and the clavicle, in case of affection of one apex, it does not extend beyond the second rib anteriorly.

II. Disease of slight severity, more extensive than I, but affecting at most the volume of one lobe; or severe disease, extending at most to the volume of one-half lobe.

III. All cases extending beyond II, and all such with considerable cavity formation.

By disease of *slight severity* is to be understood: disseminated foci manifested by slight dullness, indistinct rough or weak vesicular, vesiculo-bronchial, or broncho-vesicular breathing and fine and medium râles.

By *severe disease:* dense infiltration recognised by marked dullness, very weak (indeterminate) broncho-vesicular, or bronchial breathing, with or without râles.

Considerable cavity formation, as recognised by tympanitic sound, amphoric breathing, and extensive, coarse consonating râles come under Stage III.

Pleuritic dullness, if only of a few centimeters extent is to be left out of account; if it is considerable, pleuritis should be especially mentioned under tuberculous complications.

The stage of disease is to be indicated for each side separately. The case, as a whole, is to be classified according to the more diseased side; for example: R II, L I—Stage II.

The National Association for the Study and Prevention of Tuberculosis followed the dominant anatomic basis of the Turban and Turban-Gerhardt classifications but added a physiologic conception by requiring the consideration of symptoms in determining the status of the patient. This is a real advance in the conception of the disease. In practice, however, it seems that the anatomic overshadows the physiologic aspects. The classification is as follows:

Incipient.—Slight or no constitutional symptoms (including particularly gastric or intestinal disturbance or rapid loss of weight). Slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours.

Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.

Slight infiltration limited to the apex of one or both lungs or a small part of one lobe.

No tuberculous complications.

Moderately advanced.—No marked impairment of function, either local or constitutional.

Marked infiltration more extensive than under incipient, with little or no evidence of cavity formation.

No serious tuberculous complications.

Far advanced.—Marked impairment of function, local and constitutional.

Extensive localized infiltration or consolidation in one or more lobes.

Or disseminated areas of cavity formation.

Or serious tuberculous complications.

This was further amplified and the physiologic conception further emphasized by Rathbun and adopted by the American Sanatorium Association in 1916, as follows:

Lesions	Symptoms
Incipient. Slight infiltration in the apex of one or both lungs, or a small part of one lobe. No tuberculous complications.	A. (Slight or None). Slight or no constitutional symptoms, including particularly gastric or intestinal disturbance, or rapid loss of weight; slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.
Moderately Advanced. Marked infiltration, more extensive than under incipient, with little or no evidence of cavity formation. No serious tuberculous complications.	B. (Moderate). No marked impairment of function, either local or constitutional.
Far advanced. Extensive localized infiltration or consolidation in one or more lobes. Or disseminated areas of cavity formation. Or serious tuberculous complications.	C. (Severe). Marked impairment of function, local and constitutional.

Acute Generalized Miliary Tuberculosis

This scheme offers the following combinations:

Incipient A.	Moderately Advanced A.	Far Advanced A.
Incipient B.	Moderately Advanced B.	Far Advanced B.
Incipient C	Moderately Advanced C.	Far Advanced C.

In addition to the classification already adopted, Brown, Heise, and Sampson[4] suggested the following x-ray findings:

Minimal: X-ray findings to show a total area involved (parenchymatous) not greater than the area to the upper level of the 2d chondrosternal junction on one side (both sides may be involved) in the form of scattered mottling, or an intense shadow interpreted as pleuritic.

Moderately advanced: The x-ray to show an intense shadow, not interpreted as pleuritic, of no greater extent than the area above the upper level of the 4th chondro-sternal junction on one side; or areas of rarefaction interpreted as cavities limited to one interspace; or scattered mottling over a greater area than under "minimal" but not greater than the area of one entire lung and to the level of the 2d chondrosternal junction on the opposite side.

Far Advanced: The x-ray to show an intense shadow, not interpreted as pleuritic, of greater extent than the area above the upper level of the fourth chondro-sternal junction of one side, or areas of rarefaction interpreted as cavities, greater than one interspace, or scattered mottling greater in extent than under "moderately advanced."

The following will be the conditions on discharge:

Apparently arrested: All constitutional symptoms and expectoration with bacilli absent for a period of three months; the physical signs and x-ray findings to be those of a healed lesion.

Quiescent: Absence of all constitutional symptoms; expectoration and bacilli may or may not be present; physical signs and x-ray findings to be stationary or retrogressive; the foregoing conditions to have existed for at least two months. It must be borne in mind that increase of physical signs with lessening of symptoms and improvement of general condition may occur in quiescent cases. However in these cases the x-ray must be stationary or retrogressive. The length of time mentioned is, of course, somewhat arbitrary, but is intended to cover the cases which frequently occur where the patients leave a sanatorium for various reasons, contrary to advice, after a stay of a few weeks, although all active symptoms may have ceased completely soon after entrance.

Improved: Constitutional symptoms lessened or entirely absent, physical signs and x-ray findings improved or unchanged; cough and expectoration with bacilli usually present.

Unimproved and Progressive: All essential symptoms, physical signs and x-ray findings unabated or increased.

Died.

ULTIMATE RESULTS

Apparently Cured: All constitutional symptoms and expectoration with bacilli absent for a period of two years under ordinary conditions of life.

Well: Patients who fulfill all the conditions required under "apparently cured" but about whose sputum no definite information can be obtained.

Arrested: See "Quiescent" above.

Improved: See above.

Progressive: See above.

Dead.

Precedent to a discussion of classifications it is well to consider the purposes which they are intended to serve. Prior to the beginning of the present century tuberculosis had received but scant attention at the hands of medical men. Then the disease began to lose its hopelessness and a great interest was created throughout the medical world in its prevention and cure. Turban offered his classification at that time as a means "of arriving at uniformity" in reporting patients and the result of their treatment, believing that "its degree of spreading" was the most important factor in prognosis.

Uniformity presupposes that all examiners have equal or nearly equal ability to examine and that all examine with equal care; and further, that all interpret with equal judgment; but such is not the case. Classifications have served good purposes, but they have done this in spite of the fact that they have not produced uniformity. Classification of the disease in stages has done much to show that the less extensive cases of tuberculosis without marked physiologic disturbance, are the more favorable ones for treatment. It has further demonstrated to more careful observers that anatomic extent without taking into consideration physiologic severity is of comparative little value in prognosis except when gross destruction of tissue has occurred, and has also caused examiners to study their cases with greater earnestness and examine with greater care, a very important thing during the period when the study of clinical tuberculosis was in the stage of rapid development.

The greatest error fostered by following classifications is that of impressing upon the minds of men that the extent of the lesion is the greatest factor, and that the seriousness of the case can be mechanically measured. It has caused workers to concentrate their attention upon the disease instead of the patient. While the classifications which are followed in this country are a combination of extent and character of the lesion on the anatomic side and of the manner in which the patient is reacting on the physiologic side, yet in reality the anatomic side is uppermost in the minds of nearly all observers. Aside from emphasizing the anatomic side unduly, where the physiologic side is considered, the symptoms are treated too much as though they were distinct and separate phenomena always caused by the same condition. It is an attempt to assign mechanical exactness to processes which by nature are most inexact.

All classifications emphasize and aim at the myth of medicine, "uniformity;" when, in actual practice, uniformity can not exist.

As long as the balance between the developing powers of bacilli and the resistant qualities of different patients differ; and as long as the nervous, chemical and psychical equilibrium of patients differ, so long will uniformity in disease of the human being be unattained and unattainable. Race, age, economic status, constitution, growth, nerve and chemical balance, and psychical equilibrium are some of the factors that must be considered in every case. Likewise the ability of the examiner and the methods used permit of very great variation.

In no way can the methods used be illustrated better than in the examination of sputum for bacilli, a procedure which many think fairly exact. On the contrary the determination of the presence or absence of bacilli in the sputum as carried out in laboratory practice is a very inexact procedure, and even as suggested in the classification adopted by the National Association is subject to great error. The requirements as suggested are as follows:

"A careful microscopic examination, with a mechanical stage, of two smears, devoting at least three minutes to each smear, made from selected particles (at least six from different parts) of the sputum on each of three successive days. The morning sputum should always be obtained, or better the minute bits that some arrested patients raise at very infrequent intervals. It is not yet deemed wise to insist on digestion and centrifugalization or on inoculation of guinea pigs."

In a comparison of direct smear with a method of enrichment, which we use in our laboratory, it was shown that in 409 comparisons, the number of bacilli found in a given time of search was 14.7 times greater by the latter than by the former method. In order to find bacilli with direct smear methods, Dr. J. E. Pottenger has computed that there must be about two thousand bacilli per cubic millimeter of substance examined while with the enrichment method they may be found, if present, in numbers of about two hundred per cubic millimeter.

The length of time spent in searching the specimen in case of rare bacilli is also of tremendous importance, as will be seen from the following analysis based on one, three, five, ten and fifteen minutes' search in the 409 specimens above mentioned.

Diagnosis made in	1 minute's search	29 per cent.
Diagnosis made in	3 minutes' search	59 per cent.
Diagnosis made in	5 minutes' search	72 per cent.
Diagnosis made in	10 minutes' search	92 per cent.
Diagnosis made in	15 minutes' search	100 per cent.

Search was carried out in some instances for two hours, but it was found that only rarely was a diagnosis made after the fifteenth minute. Therefore, we have established this enrichment method with fifteen minutes' search as the standard in our work.

It is desirable to know as nearly as possible what are the chances for a given patient to improve, or to bring his disease to a state of quiescence or arrestment; but such an opinion cannot be given except after studying the individual from many different angles over an indefinite period of time. The disease is a chronic one and shows different phases at different times. It cannot be judged by the extent of the lesion alone, nor by its character, nor by the symptomatology at the time of examination, nor by the symptoms which are observed over any brief period. An opinion or prognosis must be based on the examiner's opinion after all available data have been considered, and after the patient has been observed long enough to show the particular type that the disease presents and the

character of the patient's resistance. It seems to me that we should treat the disease, tuberculosis, in the same manner that we treat other diseases, and that our classification should be a judgment based on all available data. The most important thing for the physician to know from the anatomical basis, is, not the extent, but whether the case is fibroid or necrotic in type, or predominantly fibroid or predominantly necrotic in type; and whether the process is progressive or stationary; and, from the physiologic standpoint, how the disease is affecting the physiologic processes of the body of the patient. From this we may determine that a given patient presents a favorable, doubtful, or unfavorable aspect, the same as we do in other diseases. The nature of this opinion, however, must necessarily differ with the examiner's experience and ability the same as in dealing with other diseases.

Such a classification would be based on the same principles which govern prognosis in every other disease—a full consideration of the disease and the patient. It may be no more uniform than that of stages, but should not be less so; and should possess the advantage that the examiner would not be obliged to fit all of his data into arbitrary standards. Like the present classification, it would depend on the examiner's opinion, but it would be freed from time-consuming attempts at standardization, which are of doubtful utility.

The scheme of classification suggested by Brown, Heise and Sampson,[4] given above, also the one presented by Waters and Amberson[5] in which findings of the x-ray are to be added to those of the older classifications are a magnification of the anatomic conception. Brown and his coworkers state that, "many have come to believe that, accepting a diagnosis of pulmonary tuberculosis, the symptoms reveal what is happening at the time of examination and consequently of classification but to the majority of workers in pulmonary tuberculosis it has appeared that a classification based on the *extent* of the pulmonary disease is to be preferred to all others." In an analysis of 814 of their own cases they state that the disease was more extensive in 48 per cent. than had shown on physical examination, therefore they believe that the x-ray should be used in determing the classification of cases. Waters likewise believes that the stereogram is necessary to determine the extent and character of the lesion in from twenty to thirty per cent.

I would like to ask the question, is the knowledge gained by this attempt at mathematical measurement adding sufficient practical benefit to the every day clinical handling of tuberculosis to make it worth while to increase the already lengthy description used in classifications, or is it rather a special piece of work establishing the fact that physical findings and x-ray examination differ somewhat in the extent of a given lesion, the latter usually showing more? Every piece of machinery makes errors, and the more utilized, the greater the danger of inexactness. If the x-ray findings can be properly made and interpreted it will add to the anatomic exactness, but it still falls short of furnishing a basis for prognosis.

The reason given for offering these new classifications is the same in both instances, viz., that the full *extent* of the lesion is not being discovered by present methods. Let us first find out whether knowing that there is half a lobe or two-thirds of a lobe involved is necessary to an understanding of the disease. Can any one measure the volume of lung involved either by physical or x-ray examination with sufficient accuracy to make this procedure a necessity in order to give a prognosis? And, after all, the ultimate reason for classification is that we may the better be able to prognosticate what the result will be in a given patient.

The divisions marking Stage I, II and III or minimal, moderately advanced, and advanced are purely arbitrary. They in no way tell us definitely what is occurring. It is far better to have a whole lobe involved with a non-virulent fibroid type of the disease than to have an area of necrosis as large as a marble or "a cavity limited in diameter to the width of the first rib at the level of the clavicle" because this type of lesion shows that the fighting balance is on the side of the patient. Further a patient who withstands an extensive active lesion will have far better chances of getting well than one who withstands a small lesion poorly. The real thing that we want to know is not so much how much lung is involved, but how is the patient reacting to the disease that he has and is he able to overcome it? What are his fighting qualities when a lesion of a given extent is present? Is the normal smooth working of his body cells interfered with and to what extent? Is he or is he not showing resistance? Is he destroying bacilli and inhibiting the multiplication of others and preventing the spread of the disease,—in other words, what is the physiologic as well as anatomic response of the individual toward his tuberculosis? So, while we cannot and should not divorce our thoughts from the extent of the anatomic involvement, and the character of the pathologic changes which have taken place, yet our chief concern should be the amount of deviation from the normal physiologic working of the body cells which has taken place.

The relatively greater importance of this physiologic as compared with the usual anatomic conception is illustrated daily in our clinical experience. While, all else being equal, the greater the extent of the disease, the greater its seriousness, yet the extent of the lesion alone is but a minor point in destroying the patient, and furthermore, at best, it cannot be even approximately measured. The intensity, or the manner in which it destroys the normal working equilibrium of the body cells is the chief factor—the physiologic departures from the normal rather than the anatomic. This is more easily measured because it is expressed in symptoms. The ability of the physiologic forces of the body to repair the anatomic destruction is another important factor.

One patient will suffer from a progressive necrosis which eventually destroys a large part of one or both lungs and still be able to regain a fair degree of health, because his physiologic balance is well preserved in spite of the extent and severity of the disease. On the other hand we

sometimes see a small lesion which profoundly affects the physiologic equilibrium of the patient and so depresses his reacting powers that the disease spreads and becomes a menacing disease.

We also now and then see what seems to be a slight lesion anatomically considered, accompanied by very few recognized symptoms and yet healing is accomplished only with great difficulty. Such cases, in my estimation, are naturally of slight virulence but fail to heal with usual rapidity because of a lack of physiologic balance on the part of the patient.

In considering the relative value of symptoms, one must take their duration or permanency into consideration, and the manner in which they affect the recuperative powers of the patient, as well as the factor which causes them.

A temperature of 102 or higher is of very different significance if it is persistent, or repeated at frequent intervals than if it is only of a few days' duration. It is also of different significance when present if the patient is exercising from what it is if he is resting. If it is increased in severity and maintained by worry it is of less significance than the same degree when the patient is happy and optimistic, because by eliminating the harmful mental state the patient improves.

The *pulse rate* differs according to the nervous and psychical state of the patient, and according to the condition under which he is living, as well as the activity of the disease. So an increase in rate alone means nothing.

Loss of weight may be caused by a lessened intake in food, due to disturbance in appetite, or a reduced power of digestion, or an increase in metabolic rate. In early clinical tuberculosis the loss which occurs is usually influenced much less by the disease than by the conditions surrounding the patient. So loss of weight is only serious when due to conditions which can not be corrected.

The *cough, expectoration* and *number of bacilli* are also variable, and misleading if considered only at some particular period of the disease. If considered only in relation to numbers, when a necrotic area is sloughing out the increase in numbers would be interpreted as indicating a very serious condition; but, a few weeks later, the activity in the process may have quieted down and the patient may be cough, expectoration and bacillus free; or, at least, all of these symptoms may be very much decreased.

Much the same may be said of all the symptoms which belong to tuberculosis.

Before we can classify our patient and make a prognosis with anything approaching accuracy, we must understand what it is that kills the tuberculous patient. At present we are not permitted to know this fully. We assume, however, that it is not primarily the disease itself. It is not primarily the inability of the lungs to furnish oxygen, nor the inability of the heart to sustain the circulation. The patent succumbs to his disease, apparently, because his physiologic processes are so disturbed that

the body cannot be kept in a state compatible with life. This implies a lessened ability to resist the onward march of the bacilli.

If we were to analyze all of the symptoms which accompany tuberculosis, we would see that the toxic symptoms are the ones which affect the physiologic working of the patient most. The effect of cough, however, must not be minimized, for when it is severe it increases the demands upon the patient's energy enormously. This has been estimated at from five to ten per cent. In severe cases, it must be much more than this. Reflex disturbances in the gastro-intestinal canal at times also

ETIOLOGICAL CLASSIFICATION OF COMMON SYMPTOMS OF PULMONARY TUBERCULOSIS

Group I.

Symptoms Due To Toxemia

Caused by Harmful Stimulation of	*Symptoms*
I. Nervous System in General II. Endocrin System in General	1. Malaise 2. Lack of Endurance 3. Loss of Strength
	4. Nerve Instability
III. Sympathetic Nervous System IV. Sympathicotropic Endocrins. Particularly Adrenals and Thyroid.	5. Diminished Digestive Activity 6. Increased Metabolic Rate 7. Loss of Weight 8. Increased Pulse Rate 9. Night Sweats 10. Temperature (partly)

Group II.

Symptoms Due To Reflex Cause

Hoarseness
Tickling in Larynx
Cough
Digestive Disturbances
(Hypermotility and Hypersecretion)
Loss of Weight
Circulatory Disturbances
Chest and Shoulder Pains
Spasm of Muscles of Shoulder Girdle and Diaphragm
Flushing of Face

Group III.

Symptoms and Syndromes Due To The Process *per se*

Spitting of Blood
Sputum
Frequent and Protracted Colds (Tuberculous Bronchitis)
Pleurisy (Tuberculosis of the Pleura)

become serious, and threaten the patient through failure of nutrition. The effect of these reflex symptoms when they become severe must not be under-rated, for often the difference between an arrestment and a failure at arrestment narrows to a very small margin. But the overshadowing importance of the toxic symptoms must be evident to all observers. This may be readily seen from the following grouping of some of the more common symptoms which are present during the disease.

With this grouping one readily discerns that, while these symptoms which are classed in Groups II and III as being of reflex origin and due to the tuberculous process *per se* may cause annoyance, they are not the symptoms which generally effect the serious changes in the organism. It is to the toxic group that we regularly assign the real danger to life. As a result of the action of toxins we have a more or less general harmful stimulation of the nerve cells which results in a general nerve instability. We further have a disturbance in the endocrin system resulting in a disturbance in the normal chemical control of the body. There results an increased acid condition of the tissues,[6] with a diminution of the free water of the body.[7] [8] This interferes with the normal chemical activity, which should take place and without which the body cannot be kept in a state of health. Whether this is a result of action through the nerves or internal secretion, or a direct action upon the body colloids is not plain. These are some of the evident causes of a failure of resistance which permits the disease to spread. There are further factors which we are only able to suggest but which we cannot define, such as the normal underlying, endocrin, nervous and psychic equilibriums, which influence the manner in which one reacts to given definite disease processes.

The real prognosis in tuberculosis, then, is in this sense individual. It does not depend alone upon the extent of the disease, nor even upon the intensity of the disease, but upon the manner in which the individual is able to preserve his physiologic equilibrium in spite of its existence and severity.

Two patients may be suffering from a tuberculosis of similar extent and as far as we are able to judge of similar intensity. Both may have a similar degree of pyrexia. One may sleep well, preserve his appetite, put on weight and feel well, while the other suffers from loss of appetite, poor digestion, loss of weight, and feels badly. What is the difference? It is not so much in the disease, as in the manner in which the two patients react toward the disease. It is not the anatomic extent of the disease or the anatomic character of the disease process that makes the difference but the difference is in the physiologic equilibrium of the two patients; and it must be remembered that the physiologic equilibrium depends not alone upon physical stimuli but psychic as well.

Without the action of the toxins in tuberculosis, there would still be many annoying symptoms, but I doubt there being many serious ones. So, in studying a given case of tuberculosis in order to determine the prognosis I would suggest that the symptoms which are of greatest im-

port are those belonging to the toxic group. In one case one symptom may be most prominent; in another, varying with the physiologic balance which is normal to the individual as well as the one maintained during the illness; but any case which shows for any great length of time an unfavorable reaction to the toxins, must be classed as relatively unfavorable.

The symptoms in the end are the key to prognosis, and must be considered at least equally with the extent of the lesion. It may be too bold to suggest that the classification of tuberculosis into stages be abolished; yet I am convinced that we have progressed sufficiently far now to divorce ourselves from the domination of the anatomic conception. The anatomic conception has a tendency to force a mechanical attitude toward the disease and to do away with the personal element, which is the greatest factor in disease. The physiologic conception, on the other hand, is based on the personal element, hence encourages the study of each patient as a reacting organism. An intelligent understanding of tuberculosis, however, can be obtained only by combining the two. If we are to continue classifications, let them be based more generally upon a physiologic conception of the disease, in which its chronic nature is fully recognized.

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