

been reported by different men, but those given will serve to illustrate sufficiently the great aid in giving the prognosis in renal cases, regarding the duration of life, furnished by the additional knowledge of the presence of characteristic changes in the eyes, especially when we realize how uncertain it is in such cases when the eyes do not present these changes.

DISCUSSION.

DR. CHANNING FROTHINGHAM, JR., Boston: Mr. Chairman and members of the Society: After listening to these two very interesting papers, it is hard to do anything more than to simply reiterate what has already been so completely expressed.

There is one point on which I feel that I should like to criticize Dr. Peabody's paper. I fear, however, that probably none of you will agree with me. I think we ought to stop using the term, "chronic interstitial nephritis." It seems to me it is a rather vague term, although well grounded in the minds of the profession. If one looks at Dr. Mallory's excellent book on pathology, and sees how he has gone back to the original lesion in his classification of chronic kidney disease, it seems only reasonable to adopt his nomenclature, so that from the name, one may draw a mental picture of the disease from the outset. Chronic vascular nephritis is the name which should be applied to most of the cases of interstitial nephritis. At the present time, however, it is impossible by our methods of diagnosis to tell the difference between chronic vascular nephritis and the late stages of a chronic glomerulo-nephritis, although under the microscope the difference is readily seen.

Before emphasizing the points which Dr. Peabody has mentioned so well, I think the first thing for the practitioner of medicine to realize is that it is practically impossible with the means which we commonly use for making a diagnosis of nephritis to make an accurate prognosis. In other words, the examination of the urine for albumin and casts and estimation of the blood pressure only help us in making a diagnosis. The amount of albumin and casts in the urine is simply indicative of the amount of kidney destruction which is going on at that time. They are not indicative of how long that particular kidney is going to last. An increased blood pressure is probably indicative of a chronic nephritis. It is not indicative of the severity of the nephritis. Frequently we see cases as they reach their terminal stages and are becoming uraemic with the blood pressure considerably less than people who are apparently well and active.

The examination of the eye grounds may be of some prognostic as well as diagnostic value. For, although evidence of nephritis, when found in examination of the eye-grounds, as Dr. Thompson has pointed out, is a bad prognostic

sign, you must remember that a good many cases come to a fatal termination without evidence of changes in the eye-grounds, at least so far as they may be detected by those who are not expert in an examination of the fundi. Therefore, after making the diagnosis of nephritis, you either have to guess as to the length of life of the individual patient, or else you have to turn for aid to some of these functional tests which have been presented. Of the functional tests, I agree with Dr. Peabody, that the phthalein test at the present time is probably the most satisfactory for the general practitioner.

Let us remember that in the early stages of chronic nephritis, practically all of these renal function tests may be normal, and, therefore, that they are only of prognostic value as the nephritis becomes more advanced. In certain cases of nephritis, the phthalein test may be normal, and in certain cases of passive congestion without renal involvement it may be abnormal. It is, therefore, advisable to do more than one test for renal function, if possible, in each case. The other test which seems to me to be practical for the practitioner to make, is the examination of the blood for urea or total nitrogen. I do not mean that the practitioner will have to make the chemical analysis himself, but that he should simply draw the blood under the conditions which are recommended in these tests, and then send it to some laboratory equipped for making such examinations. In a given case of chronic nephritis, therefore, after making the diagnosis, you should turn to the functional tests. First estimate the ability of the kidney to eliminate phthalein. If that is normal, it is usually safe to assume that the nephritis is not far advanced, and further studies are not so necessary. If that is abnormal, however, before a definite prognosis is made, other tests should be done. Either the general practitioner can collect the blood and send it to a laboratory for a study of the urea or nitrogen, or he may avail himself of one of the various clinics which are now springing up throughout the country at which, in a few days, careful studies of the renal function may be made. This in no way should interfere with the relation between the practitioner and his patient, for it is understood that such patients are going to the hospital only for functional studies, and not for treatment.

There is one other point that might be mentioned here. All of our functional tests, or at least the great majority of them, at the present time, simply tell us how sick a nephritis case is. We hope, then, in the future, that functional or other tests will be devised which may be applied to mild cases of nephritis or to incipient cases, so that we may make an earlier diagnosis and institute more intelligent treatment in time to vary materially the course of the disease.

DR. GEORGE S. DERBY, Boston: Mr. Chairman and gentlemen: Dr. Thompson has covered this subject of the eye changes in nephritis so well, that all I can do is to add, perhaps, one or two points which, on account of lack of time, he was unable to put in. The first thing I want to call your attention to is the fact that albuminuric retinitis is not the only process which occurs in renal disease. We have also the so-called uraemic amaurosis, which is an entirely different proposition, due to uraemic poisoning, and which comes on as sudden blindness in from eight to twenty-four hours in the patient, accompanied by the other signs of uremia and often coma. This clears up in from twelve to twenty-four hours, the vision comes back to normal, and an examination during the time of blindness discloses absolutely nothing in the fundus whatever, because the process is situated back in the brain.

Now, the term albuminuric retinitis is a misnomer. It should be called renal or nephritic retinitis, because the albuminuria has nothing at all to do with it.

As Dr. Thompson said, twenty-five per cent. would be a fair estimate of the proportionate number of cases in which it occurs. Some estimates run below that. Probably if cases of this nature were followed until death occurred, we should find it in about one-third, thirty-three per cent. In the nephritis of pregnancy, it is rather less common.

Now, I feel that I differ a little bit from Dr. Thompson in what he said about recognizing these cases of albuminuric retinitis. It seems to me that the cases where you can say right out, "This is surely a case of renal disease," are in the minority. There are a great many cases where the appearance suggests it, but where it is not absolutely typical and you can only surmise it. In addition to that, there are a great many cases where the changes are extremely slight and you must have your other examinations made before you can say that the changes are due to a nephritis.

In a paper by Dr. Slocum, of Ann Arbor, Michigan, which is going to be presented a week from today at Detroit, out of seventy-three cases of nephritis where the eyes were examined very carefully, only five were found in which the typical star figure of albuminuric retinitis was present—only five out of seventy-three, that is, about six per cent.

It is in the cases of interstitial nephritis where the diagnosis is more often made by the oculist first. The patient suddenly notices a blurring of vision, goes to the oculist, and a well developed retinitis is seen. I remember seeing such a case when I first started in practice. The patient, who was under treatment by a very good general practitioner for indefinite gastric symptoms, had not had her urine examined. She showed a well developed nephritic retinitis and was dead in two weeks' time.

Now, in all probability, according to the best opinion of the present day, the renal retinitis develops only if the disturbance in renal function has given rise to considerable changes in the arterial system, increased blood pressure and usually hypertrophy of the left ventricle. The disease is very rare under twelve, is common between thirty to sixty, most often seen between fifty to sixty; and except in the pregnancy cases it is seen very much more often in men. You see two cases in men to one in women. In a great majority of cases the disease appears in both eyes with a very short interval between, a few days or weeks. There are, however, some cases on record where the disease has remained entirely monocular, confined to one eye up to the time of death.

There are also changes appearing in the eyeground which cannot be classed as retinitis, and which appear much earlier in the disease. I refer to the vascular changes which are seen in the eyeground and which usually mean that there is a cardio-renal lesion. I think that in the recognition of these lesions the ophthalmologist can be of great use to the general practitioner. One needs a considerable amount of skill and perseverance to discover these lesions, and a certain amount of experience is absolutely necessary,—the sort of experience that one gets from the examination of cases in the general hospital, such as Dr. Thompson has in his examinations in the wards of the Boston City Hospital. For instance, I see a great many cases each year at the Massachusetts General Hospital where there are these slight changes, and those cases mostly are of cardio-renal disease,—cases where the prognosis is not so absolutely unfavorable as in those instances where you find a very definite retinitis. I think the ophthalmologist can do a great deal in the routine fundus examination of people as they come for glasses between the ages of forty and sixty, and can very often spot a lesion in the vessels and send the patient around to the general practitioner. Very often in that way quite a number of useful years can be added to the patient's life, by discovering the lesion earlier than it would be discovered otherwise.

REMARKS ON BLOOD-PRESSURE.

DR. G. V. N. DEARBORN, Cambridge: Mr. Chairman, and ladies and gentlemen: In the course of uncompleted observations on the relations of the mental process to blood-pressure (which has been my chief and particular form of research for two or three years), I came to a knowledge of the extremely wide variations in the blood-pressure,—both diastolic and systolic, and in both children and adults,—which I am sure is of practical application and of practical use to the average clinician. I have here about 140 graphs made from relatively continuous records of blood-pressure, each from two minutes up to about one hundred minutes in length

(one hour and three-quarters)—something, I think, which has not been done before. These are the originals, and I pass them around, for I would like to have you see what they are like; I am sorry that I cannot circulate them in some sort of regularity, or in order.

The best I can do, of course, in my brief allowance of time, is to suggest very summarily indeed some of the clinical conclusions which I think would be of the most practical interest to you. The first thing I want to point out is that there are always at least six or seven uncertainties in every blood-pressure determination. The first one (most commonly overlooked) is *the muscular tension of the arm*. The arm, of course, is actually not a fluid. Theoretically for blood-pressure tests it is a "perfect fluid," but in reality it is not so, and any increase in the tonus of the muscles certainly changes the blood-pressure. The second uncertainty is the *varying tension of the artery*, an element which has been sometimes overlooked. The artery, in order to be relatively incompressible, does not have to be sclerosed; it may be merely vasoconstricted. Of course you have a continually decreasing resistance to your decompression as the artery becomes less and less constricted. Third, is *the shape of a cross-section* of the artery. When it is a round tube it is obviously a series of arches, but as the artery collapses these become broken arches, and of course these are very weak as structural units. The fourth element that is to be taken into consideration is the *training-index* of the patient, whether the patient be a physically trained individual or not, and particularly whether he has had very recent exercise or not. A physician recently told me about a layman who went up in a high office building in New York City to have his blood-pressure measured and to take the remainder of a life-insurance examination. The elevator was not running and he walked up four or five flights of stairs in a hurry and excitedly. On the basis of his blood-pressure he was "rejected." The *excitement-index* of the patient necessarily comes into all these cases and is an important unknown factor until determined. The *mental activity* of the patient is a factor,—whether he is emotional or not, whether he is thinking or not, and so on. Then, occasionally I have found in the 4,800 measurements of blood-pressure which I have made in the last three years a distinct *dilator spasm (or else atony)* of the artery, something which, so far as I know, has not been described, but which immediately "throws out," *i.e.*, stops, all of the Korotkoff sounds which you have to hear in determining the arterial tension. The artery certainly "has a habit" under conditions to be determined, of suddenly expanding, and thus losing all the sounds. There is finally a *vasomotor neurosis*, not the "hypertonia vasorum idiopathica" that you find described in some of the text-books, but a distinct neurosis of

the immediate vasomotor apparatus which gives rise to long-continued high blood-pressures. For instance, a worried man of sixty-five had his pressure consistently up to 260 two or three years ago; he had no discoverable lesions in the kidneys or in any other organs whatever; he is now down to a reasonable blood-pressure for that age. I think we must be expecting soon the neurologic description of a vasomotor neurosis, one might almost call it a psychosis, which raises blood-pressure far above the danger sign, for example, in interstitial nephritis.

Now, there are certain practical and clinical deductions which I venture to make from these 140 "continuous" graphs which are in your hands. I have divided them into nine groups, and when the research-report is properly prepared they probably will be set forth in that manner. In Group A, there are those curves which show an enormous initial variation from day to day, sometimes as much as thirty millimeters with no apparent cause whatever except recondite physiological conditions, which seldom have been taken into consideration. Group B shows a large and progressive fall from the first taking for 15 or 20 minutes. The average physician over the land does not realize, when he finds a patient's pressure a little higher than he thinks it ought to be, that perhaps 20 minutes later it may be 30 or 40 millimeters lower. One of these graphs shows 34 millimeters progressive physiological fall within 15 minutes in a normal individual under the quietest conditions.

Voluntary relaxation plotted in Group E is something I wish to call to your attention simply as a matter of expediency in insurance-examinations. A physician in a neighboring town voluntarily relaxed his muscles and in that way, as you see, reduced his blood-pressure, and then raised it by holding his breath, so that there was within 15 minutes a voluntary rise of 119 millimeters. First, he deliberately lowered his pressure (systolic) about 24 millimeters, and then he raised it to 230, a voluntary variation of 119 millimeters within 15 minutes, down and up. Anyone that understood the trick could do that in the course of a life-insurance examination, and no one the wiser, under present methods of using the gauge.

Normal variation is enormously large, as Group F shows. The most marked graph which I have had showed a wholly spontaneous variation up and down of approximately 40 millimeters within five minutes. This was a woman of about fifty-nine, a normal person, but a nervous woman with "a New England conscience," as Professor Putnam says, a woman whose autonomy is undoubtedly easily affected by emotional and intellectual stimuli.

Anesthetics (Group J) have characteristic blood-pressures. Mental defectives (Group H), the so-called feeble-minded, also have charac-

teristic blood-pressures, into the nature of which we cannot now go.

I wish to suggest that the diastolic pressure is only a little less variable than the systolic. One medical gentleman, again, said, "We never pay much attention to the blood-pressure of children anyhow." But my records, graphs, show that blood-pressure is almost as variable in adults as it is in children, and often more so.

I wish, then, to suggest as theoretic corollaries, that in the first place the physiologists should study vasomotion, and study it extensively. We must investigate the physics of the arm. We must understand the mental influences.

And then there are five practical corollaries: In the first place, *use twenty minutes instead of one in "taking a blood pressure,"* both diastolic and systolic; use twenty minutes instead of one, and take both the readings every minute, or at least every two minutes. I see one clinician smiling at that, but it is either that, ladies and gentlemen, or else a doubtful report; either fifteen or twenty minutes, or a misleading notion of that individual's real, effective blood-pressure. Second, *interpret no reading, save as the algebraic balance of two dozen or more factors and modifiers.* Third, *don't scare the patients, unless you have some personal reason for taking too high a blood-pressure.* Fourth, *the pressure in the brain and in the autonomic centers is more important than the pressure in the arm;* and we need a method of finding the pressure in these former places. And, fifth, there is probably a frequent neurosis, a well-defined "middle-age" vasomotor neurosis, which raises the blood-pressure without indicating anything of broad prognostic significance so far as we at present know.

DR. H. D. ARNOLD, Boston: The papers have been presented so ably that there is little room for discussion. I would like to say just a word, however, in reply to Dr. Frothingham's challenge,—that probably the rest of us wouldn't agree with him in abandoning the use of the term, "chronic interstitial nephritis."

It seems to me that perhaps it is better to "bear those ills we have than fly to others that we know not of," particularly as one of the really disappointing conditions in our present study of nephritis is the failure of the pathologist to correlate the pathological evidence with our clinical experience. Dr. Frothingham's suggestion of "chronic vascular nephritis" in place of "chronic interstitial nephritis" is valuable, I believe, for a considerable number of cases; but until we know the subject a little more thoroughly and know how far that term, "chronic vascular nephritis," would be a really proper term for our cases, I believe we should be no better off than we are with the present term,—recognizing that the present term is unsatisfactory.

A very interesting thing to me in studying

the cases clinically, which are ordinarily classed under the head of chronic interstitial nephritis, is to find a class of cases in which regulation of the diet seems to be followed by a very definite reduction in the blood-pressure. In these cases the natural interpretation seems to be that when you get the demand for elimination down to the capacity of the kidneys you have relieved a condition which is a factor in the high pressure.

Now, there is a class of cases in which the blood-pressure is only slightly, if at all, affected by dietary treatment; and it seems to me that in those cases at least the high pressure is very likely a compensatory measure. In some of these cases which I have studied by the functional tests, it has been shown that the vascular system is much more concerned in the process than are the renal elements proper. I believe we are going to recognize clinically, as we go on, different sub-divisions of what we now call chronic interstitial nephritis, and that one of these sub-divisions will be these cases where hypersensitiveness of the vascular system is a determining factor. I am wondering whether "chronic vascular nephritis" is not a term to be reserved for this sub-division, rather than to be applied to all cases which we now class as chronic interstitial nephritis.

Original Articles.

THE PHYSIOLOGICAL POINT OF VIEW AND AUTOPSIES.

BY FRANCIS H. McCrudden, M.D., BOSTON,

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THE usefulness of a point of view once established, the problem arises of extending its influence. At the Robert B. Brigham Hospital where we are demonstrating to physicians,¹ students,² patients, and others, the usefulness of the physiological point of view of the problem of treatment in chronic disease, it is evident that the patients appreciate its usefulness.³

From the large proportion of cases of death in which permission for autopsy is obtained, it has become evident that our ideas are spreading to the relatives of the patients.

Since the hospital opened on April 1, 1916, complete autopsies have been carried out on 70% of all those dying (35 autopsies in 50 deaths). The figure for 1914 is 74% (14 cases out of 19 deaths); that for 1916 so far (May 1) 100%. No other American hospital has attained results that at all approach these.

The figures which follow, taken from a report