

best of methods in treating gastritis, atony and dilatation. The rules for the dietetic, hygienic and medicinal treatment are much the same as those that govern the treatment of like conditions due to other causes.

In a differential diagnosis, besides the gastric conditions already mentioned, we have particularly to consider gastric crises, renal colic and Dietl's crises, appendicitis in its various forms, pancreatitis, angina pectoris, affections of the right lung and pleura, and other diseases of the liver.

The average case of cholelithiasis is not difficult of diagnosis, yet in some cases a differential diagnosis is extremely difficult and at times impossible by medical means. In some patients with apparently clear symptoms of gallstones, no stones are found; in other patients gallstones are found as the cause of trouble where least expected, but these are the exceptional cases.

We should not forget that there are many persons who have gallstones and yet have never presented the usual symptoms. It is without doubt among this class of patients that we should seek the cause of many of the obscure reflex gastric conditions.

#### TREATMENT.

First and foremost it should be understood that stones in the gall bladder probably cannot be dissolved by the administration of medicine. Certain experiments have yielded just sufficient results to lead the hopeful to believe that time and perseverance in the use of certain agents may accomplish this desired result, but abundance of clinical experience fails to prove that such is the case. We cannot in any case guarantee to ward off or delay an attack of colic, yet in many cases it certainly seems as if such result is attained, as there is no recurrence for years. Confinement to bed after an attack of colic until inflammatory conditions have subsided should be insisted upon. Kolisch believes that by careful attention to diet, medication, etc., and abstinence from sports and other forms of violent exercise for one year after the colic, latency of gallstone disease is frequently obtained. As to medicinal agents for the gall-bladder conditions and the usual digestive disturbances, I know of none better than some such combination as that recommended by Billings, as follows:

R. Sodii Salicylatis, 1.0  
Sodii Phosphatis, 2.0  
Sodii Sulphatis Exsic., 6.0  
M. Sig. 5ss to 5j in  
glass of hot water thirty  
minutes before meals.

The general attitude of both physicians and surgeons regarding operative procedure in most cases of cholelithiasis is too well fixed to warrant much discussion. Those physicians, however, who feel it their duty to advise operation in every case as soon as the diagnosis is made, and who have not done so, may find some consolation in the statement by Richardson: "I have not a few patients in whom I know gallstones to exist, and in whose cases I have not as yet advised operation.

Knowing, however, to a certainty that stones are present in the gall bladder, knowing also the precise anatomical conditions present, I am prepared to advise operation the moment the first symptom of impaction appears, unless this impaction should be of the briefest and most trivial character."

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### FURTHER OBSERVATIONS ON THE WASSERMANN REACTION FOR SYPHILIS.

BY WM. P. BOARDMAN, M.D., BOSTON.

SINCE the first publication concerning the so-called Wassermann complement fixation test for syphilis in 1906, the test has been performed by many investigators on thousands of cases of syphilis, and in other diseases of all sorts, so that a fairly conclusive idea of its limitations in certain directions may now be had.

In spite of much careful scientific work on the subject, the theory upon which the reaction is based is still obscure.

Though many modifications have been suggested to simplify the method, and though a majority of these give a higher percentage of positive results in syphilitic cases, the most of them have also been found to give positive results in many non-syphilitic cases and are, therefore, useless. In regard to the suggestion of H. Schlimpert,<sup>1</sup> which is also used by Noguchi in his book on serum diagnosis, and according to which the reagents are used in small amounts, the method remaining otherwise the same as in the original Wassermann reaction, this scheme has a distinct advantage in that it uses less blood from the patient and less guinea pig's blood. In regard to Noguchi's own modification, using a human-rabbit serum for amboceptor instead of the sheep-rabbit of the Wassermann test, and small amounts of the patient's serum without inactivation, enough has already been done with this to show that it, like the many other modifications, gives a higher percentage of positive results in syphilitics, but, like the others (though not nearly as often), it gives occasional positive results in non-syphilitics.<sup>2</sup> I have had no opportunity to try this test except in about twenty-five cases, and in these it gave the same results as the Wassermann; except in one case of a perforating ulcer of the foot, in which the Noguchi was positive and the Wassermann negative. But this series is obviously too small to be the basis of any personal conclusions.

My own results with the Wassermann reaction, based on a little over 500 cases, are with the original Wassermann technic except that I used an

<sup>1</sup> Deut. Med. Wochenschr., vol. xxxv, no. 32, p. 1386.

<sup>2</sup> Fox: Jour. Cutan. Dis., vol. xxvii, p. 338. Kaplan: Jour. Med. Sci., vol. xxxix, no. 1, p. 82.

alcoholic extract of normal liver as antigen. The blood in practically every case was taken from the patient's ear (about 1.5 to 2 ccm.), which was found to be the simplest method for obtaining blood in the average case.

I have tabulated all my results as positive or negative, classifying all doubtful or slight reactions as negative, so that my figures show a rather low percentage of positive results, but I think I have very seldom erred in reporting a positive reaction in a non-syphilitic case, as one is liable to do if he does not adhere fairly closely to this classification.

I have arranged the following table to show in a general way the percentage of positive reactions obtained by some other investigator in the various broad classes, making possible a comparison of these figures with my own.

	Cases collected by Noguchi.	Noguchi's own cases.	Fox.	Kaplan.	König.	Reinhart.	Jessioek and Melrowsky.	Bayley.	Basset-Smith.	McIntosh.	Hauck.	Knopfmacher.	Total.
<b>Primary:</b>													
Total cases,	416	23	7	138	9	144	30	22	..	27	..	..	816
Positive,	291	17	7	122	7	83	20	17	..	20	..	..	579
Negative,	125	6	0	16	2	61	10	5	..	7	..	..	237
%+	70	74	100	88	77.7	57.6	66.6	77	..	74	..	..	70.9
<b>Secondary:</b>													
Total cases,	1,605	79	37	281	42	400	93	23	57	92	..	..	2,801
+	1,434	69	36	242	42	386	90	21	55	78	..	..	2,531
-	171	10	1	39	0	14	3	2	2	14	..	..	270
%+	89.3	87.4	97	86	100	97	97	91	96	85	..	..	88
<b>Tertiary:</b>													
Total cases,	581	65	32	191	12	97	48	61	7	17	..	..	1,111
+	464	52	23	140	9	87	42	52	4	10	..	..	883
-	117	13	9	51	3	10	6	9	3	7	..	..	228
%+	79.9	80	72	73	75	89	87.5	85	57	59	..	..	79.5
<b>Latent:</b>													
Total cases,	2,094	59	54	79	23	170	434	..	7	..	..	..	2,820
+	1,014	37	25	41	13	112	208	..	1	..	..	..	1,451
-	1,080	22	29	38	10	58	226	..	6	..	..	..	1,469
%+	48	63	44	52	56	66	48	..	14	..	..	..	49.7
<b>Tables:</b>													
Total cases,	216	18	3	205	3	32	19	..	4	..	..	..	500
+	135	8	3	125	2	27	10	..	2	..	..	..	312
-	81	10	0	80	1	5	9	..	2	..	..	..	188
%+	62.5	44	100	61	66.6	84	53	Smith	50	..	..	..	62.4
<b>General paresis:</b>													
Total cases,	498	..	..	61	..	..	7	10	..	7	17	..	600
+	439	..	..	40	..	..	6	9	..	7	17	..	518
-	59	..	..	21	..	..	1	1	..	0	0	..	82
%+	88	..	..	65.5	..	..	86	90	..	100	100	..	86.3
<b>Congenital:</b>													
Total cases,	125	..	1	20	..	..	18	..	..	4	..	33	201
+	118	..	1	18	..	..	16	..	..	2	..	29	184
-	7	..	0	2	..	..	2	..	..	2	..	4	17
%+	94.4	..	100	90	..	..	89	..	..	50	..	88	91.5

Of syphilitic cases I have examined the blood in 267 cases, including parasyphilitic and latent cases.

Of these, 23 were primary lesions showing no secondary manifestations. Eleven of these, or 49%, were positive. As has been very generally found by other investigators, most of the positive results were found in the cases of long duration, — over three weeks, — the reaction sometimes not appearing until the fifth or sixth week, and even later in a few cases. My percentage is much lower than that shown in the table of collected cases from the literature, and I account for this

by the fact that many investigators have classified among primary lesions those in which the chancre is still active, but in which secondary manifestations have already appeared; such cases I have classed among the secondary cases. My results show clearly that in the earlier primary lesions the search for the spirocheta pallida is a much more reliable test, but in the older lesions, especially those in which the chancre has been treated locally, or has nearly or entirely healed over, the spirocheta is very seldom found and it is just at this time that the Wassermann reaction begins to become positive and the patient is getting restless over the long wait for secondary manifestations to appear.

In secondary cases showing lesions at the time of examination I have tried the reaction 59 times on 57 patients, with 49 cases giving a positive

and 8 a negative reaction, or 86% positive. Omitting treated cases, there were only 2 negative in the series, giving 98% positive. One of these two was a case showing a macular rash on the forehead and severe headache, both of which cleared up under anti-syphilitic treatment. The other was a beginning secondary eruption which gave a positive reaction a short time later, showing that the antibody is very late in appearing in occasional cases.

In tertiary cases showing manifestations at the time the test was made there were 88 cases, 78 positive and 10 negative, or 88.6% positive.

Among the negative cases 2 were very chronic cases of lesions of the nasal septum which had persisted for years with frequent exacerbations and more or less frequent courses of treatment. One case was a perforating ulcer of the foot diagnosed as syphilitic clinically. Three were cases of cerebral syphilis and one an old case of leukoplakia who also showed a serpiginous tubercular syphilide on the leg, both of which were much benefited by subsequent treatment. The others were all cases which had received considerable antisyphilitic treatment.

In cerebral syphilis, 8 of 11 cases, or 77%, were positive. This is higher than has generally been found by other investigators, whose figures were as low as 16% in one series. I think that this may be due to the fact that some of the cases where the diagnosis was rather uncertain clinically have been classified under the list of cases of doubtful diagnoses in my series which possibly should belong to this class. I have only had 4 cases of spinal syphilis, all of which were positive.

Of latent cases, meaning by this term patients who gave a sure history of syphilis or showed unmistakable scars of syphilis, but no active syphilitic lesions at the time of examination, there were 51; 23, or 45%, of which were positive. This corresponds fairly well with the average found in the literature. The earlier cases, that is, those within three years of the primary infection, were only 23% positive. This includes many cases which had been under long and careful treatment, which accounts for the low percentage. The cases of more than three years' duration, including some very old cases who were undoubtedly completely through with the disease, showed 51% positive results. The literature does not bear out these figures of mine, probably showing that my series is far too small to allow definite conclusions. Of 1,423 early latent cases in the literature, 724, or 51%, were positive, and of 1,164 of the late cases, 534, or 46%, were positive. But in the latent cases much depends on the amount of treatment which has recently been undergone and somewhat on the length of time since the last appearance of symptoms of the disease, so that little inference can be drawn from these general figures.

The congenital cases I examined numbered 17, and all but one were positive, or 95%. This was the fetal blood from the placenta of a syphilitic infant who showed definite syphilitic lesions and a positive test two or three weeks after birth. This supports the view generally held that congenital syphilis will almost invariably give a strong positive reaction, but that at birth we may get a negative result due to the fact that the antibodies have not yet developed in the blood.<sup>3</sup>

In contrast with this, it is curious to see how late in life the positive reaction persists, as when an interstitial keratitis develops. I have examined 9 cases of this disease (generally accepted as being due most always to congenital syphilis), and found 7, or 78%, strongly positive. One of the negatives was in a child who was supposed to be tubercu-

lous and gave a strong Von Pirquet reaction, and the other in an elderly woman forty-five years of age. Some of the positive cases were in young women seventeen or twenty years of age.

Of tabetics, my series contains but 22 cases, and only 6 of these, or 27%, showed a positive reaction. Several of the others showed a slight or doubtful reaction, but, as elsewhere in my list, I have classed all such cases as negative. The percentage falls much below that obtained by other authors, for which I can find no adequate reason, except that the number of cases may be too few to draw definite conclusions.

I have only had an opportunity to try the test on two cases of general paresis, and both were negative. Both were very early cases, possibly still doubtful in diagnosis, and it is in these early cases that the negative results are most commonly obtained.

The non-syphilitic cases numbered 161 and included nearly all the more common diseases of the skin and internal organs. Taking up those diseases in which occasional positive results have been reported; first is scarlet fever, of which I have examined 9 cases, all negative, though a few of them did show a very slight reaction, especially just following the fall in the temperature. There was no doubt in my mind, however, but that these were not strong enough to be classed as positive results. Seven cases of malignant disease were all negative, including some cases with marked cachexia.

In pulmonary tuberculosis I have had 8 cases, all but one very advanced. Three of these gave a positive reaction, but on analysis one was an Italian who could give no history on account of his inability to talk English, one a colored man from whom the blood was taken at autopsy and whose clinical record showed a very shady past, though no signs of syphilis were found at autopsy, and the third was a young man who had been with the army in Cuba and the Philippines and admitted having gone through several attacks of gonorrhea and chaneroid, but denied ever having had a hard chancre or other signs of syphilis. Neither of these three cases gives much support to the statement made by some authors that advanced tuberculosis often gives a positive Wasserman reaction, though it undoubtedly does so in occasional or rare cases. In severe acute infections, including sepsis, pneumonia and typhoid, I have had uniformly negative results, but I have only examined a few such cases.

As regards treatment and its effects on the reaction, I have had very little opportunity to follow cases along to see when the reaction disappeared under treatment, and still less to find out when the reaction appears after cessation of treatment. All I can say is that on the basis of 53 cases which had received from a few days' to several years' treatment, only 2 showed a negative reaction who had received less than two months' treatment, and a few remained positive for several years under more or less constant treatment. The latter were either cerebral or congenital or very intractable cases of other forms.

<sup>3</sup> Wechsungen: *Deut. Med. Wochenschr.*, vol. xxxv, no. 15, p. 665.

In general, the more energetic the treatment, whether with mercury or potassium iodide, the more quickly the reaction becomes negative. After cessation of treatment, the reaction often becomes positive again after a very variable time, most commonly with the recurrence of fresh symptoms of the disease. Though no definite figures are at hand, I am of the opinion that it is well to wait a few months after a long course of treatment before trying the reaction in cases where the question of prognosis and completeness of the cure is being worked out. Even after a several months' wait after cessation of treatment, the negative reaction does not have very much definite value. It seems to me, however, that it is one more point on which to base our conclusions as regards a complete cure when considered with the other points found by history and clinical examinations. Another curious effect of treatment which I have seen in one case and which is mentioned by K. Donath<sup>4</sup> is that in some untreated cases of syphilis which give a negative reaction, ten days' to two weeks' treatment is followed by a positive reaction. My case was one of a perfectly evident syphilitic throat lesion which gave a negative reaction at first; then, after about ten days' treatment, a slight reaction which was not strong enough to call positive, and, a week later, the patient still being under mild mixed treatment, a strong positive reaction was obtained. Donath suggests that this may be comparable to the so-called "*provokatorische*" reaction in primary syphilis by which an injection of mercury during the primary stage of the disease sometimes brings out a syphilitic rash within a day or two.

Of special cases which seem to me worthy of record I would mention one of three weeks' duration which healed up rapidly under local treatment with a mild dusting powder, but showed a strong positive reaction shortly after that. The physician who sent me the case agreed that in spite of no other signs of the disease the lesion might have been a hard chancre on account of my positive finding. In another week the chancre had broken down again and a typical syphilitic roseola was present on the body. I think that I speak fairly when I say that without having this positive reaction the average physician would have told this patient that his trouble was not syphilitic and no longer kept him under observation.

In three cases of enlarged liver, all diagnosed as ordinary cirrhosis, the strong positive reaction led to the diagnosis of syphilitic liver, and all three improved at once under antisiphilitic treatment, which latter would probably not have been instituted had it not been for the positive Wassermann reaction.

The diagnosis of syphilitic orchitis was made through the aid of a positive reaction in another case, and the operation for "sarcoma of the testicle" in this patient's case was indefinitely postponed.

Now as regards the value of a positive reaction: About the only diseases which have been found

in the literature to give a positive reaction with any great degree of regularity seem to be frambesia, trypanosomiasis and leprosy, and only very rarely does one find a positive reaction in other conditions outside syphilis. The only exceptions that I have seen mentioned in the literature are occasional cases of advanced tuberculosis, and severe septic conditions just before death, rare cases of scarlatina, especially just following the defervescence, malaria, especially a few days after the chills have ceased, and very rarely malignant disease, especially those showing a high degree of cachexia. Certainly from a clinical standpoint in this locality, with the exception of malignant disease, very few of those cases are liable to cause confusion with syphilis in diagnosis. Even in malignant disease a positive result is so rare that it suggests a possible old latent syphilis in addition, in some of the cases.

I, therefore, maintain that a positive reaction has very definite value and almost invariably means syphilis past or present, and in the earlier stages usually means an active lesion.

In regard to the negative reaction, much less definite conclusions can be drawn. In primary syphilis, where so many cases are negative anyhow, even though the lesion be a month old, the negative reaction has no value, though in the latter cases it may be slightly more to be depended upon than in the earlier ones when taken in connection with the clinical features of the case. In active, untreated, secondary lesions, however, the reaction is positive in such a very high percentage of cases that I think a negative reaction means that the lesions are almost surely non-syphilitic, though perhaps not absolutely so. In progressing tertiary lesions the percentage of positives is so high that we can say that a negative reaction has nearly the same definite value, but in cases of very long standing, such as an old leg ulcer of many years' standing, or an old lesion of the nasal septum, one is very apt to get a negative reaction, so that in these cases it has very little value. But in any case of supposed tertiary syphilis it is better to consider the negative finding in conjunction with the clinical evidence and even resort to the therapeutic test, though, as is well known, this also fails in some of these cases of very long standing. In latent cases the negative reaction by itself has little value, as in primary syphilis, for only about 50% are positive in such cases. But with a very indefinite history and no objective signs of a previous syphilis, it seems to me that a negative reaction is still another help in ruling out the presence of syphilis in a doubtful case.

In supposed congenital cases showing lesions at the time of examination, a negative reaction practically rules out syphilis and is of great value, for nearly every case of congenital syphilis showing lesions will give a strong positive reaction, and this even in spite of considerable treatment.

In general paresis it is generally stated that the reaction is nearly always positive, but most of the figures are drawn from cases in insane hospitals where only advanced cases are to be

<sup>4</sup> Berl. Klin. Wochenschr., vol. xlv, pp. 2015-2017.

found. Unfortunately, however, in the earlier ones where the diagnosis is still doubtful, the reaction is often negative, so that to depend on a negative reaction here would be quite misleading.

In treated cases one very seldom finds a positive result directly after the usual two or three years of careful treatment, but six months or so later it may help to show whether the disease has run out or not, and even more so if the test is repeated again after another six months' interval, watching the patient meanwhile for any clinical evidence of exacerbation. But I have not been able to produce figures to show the value of applying the test in this way, though it is being tried in several places.

Finally, in syphilophobia I have seen most gratifying results follow (up to date at any rate) the finding of a negative reaction which gives these poor sufferers something much more definite and tangible than the mere opinion of their physician based on his careful observations. And right here I might mention one of these cases previously diagnosed as syphilophobia which showed a very strong positive reaction and suggested to me the possibility of a sound and sane basis for the complaints of a few of these discouraging cases.

#### CONCLUSIONS.

A positive reaction is obtained in a large number of syphilitic cases, and if one adheres to the original Wassermann technic a positive reaction in a suspected case means syphilis almost without exception. A negative reaction in a suspected secondary or tertiary or congenital case means that it is probably not syphilis, but the finding should be used with caution and only in conjunction with clinical evidence and not by itself alone. A negative reaction in a suspected primary case, except one of long duration, and in an early case of general paresis, has very little value. In treated cases it has very little value except some months after treatment has ceased. To sum up, I think we may say that in the Wassermann reaction we have a definite aid to diagnosis, but its value in treatment and prognosis has not yet been carefully worked out.

I am glad to have this opportunity to express my thanks to Dr. Mallory for the use of the City Hospital Laboratory, and to the Boston Board of Health Laboratory for their continued courtesy and their kindness in allowing me the use of certain apparatus. I also wish to thank the staff of the City Hospital and the numerous private physicians who have given me the clinical material in such abundance.

**SANATORIUM FOR HOLLANDERS.**—The Christian Benevolent Society for Consumptives has been incorporated to establish a sanatorium for the care of those suffering from tuberculosis. The institution will be located in South Denver and will receive Hollanders from all parts of the United States. The secretary of the institution is Rev. I. Van Dollen, Denver. —*Jour. Am. Med. Asso.*

## THE TECHNIC OF ARTHROTOMY. A REPORT UPON AND DISCUSSION OF ONE HUNDRED AND NINETY-EIGHT CASES.

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(From the Orthopedic Clinic of the Carney Hospital.)

[Continued from No. 16, p. 606.]

#### LIPOMATA.

(Male Patients.)

CASE 35. L. F., male, thirty-five, married. Operation, March 19, 1902.

A large quantity of fibrin and villous thickening was found throughout the joint; considerable cloudy fluid escaped. At the lower end of the joint wound a row of thickened fringes was found which were removed.

The outer side of joint was opened and a similar condition found. One large finger-like fringe was attached to the capsule in the upper outer part of the joint. The cartilage presented a fairly normal appearance as a whole, except for a few areas which appeared thinner than normal.

Convalescence uneventful.

Discharged April 12, 1902.

CASE 36. C. F., male, fifteen, single. Operation, April 8, 1903.

Patient presents a similar condition in both knees. The right was operated upon. Numerous fringes were found, the largest of which was attached to the patellar aspect of the joint.

Convalescence progressive. No pain, temperature or discomfort.

The stitches were removed on the twelfth day. Ninety degrees of motion without pain present at this time.

Discharged April 24, 1902.

Patient refused operation on left knee.

CASE 37. T. H., male, twenty-six, single. Operation, Aug. 31, 1903.

Numerous large fringes found and removed. Two incisions were employed for the purpose.

Stitches removed on the eighth day. Forty-five degrees of passive motion present; active motion about 30°.

Nov. 16, 1903. Knee motions normal.

Three months later patient was again operated upon for spurs of the os calcis. No subjective symptoms at this time referable to knee-joint.

CASE 38. A. F. S., male, thirty, single. Operation, Nov. 4, 1903.

Patient was suffering from a villous arthritis, probably of Neisser origin. When joint was opened, about 8 oz. of yellow fluid, viscid in character, were removed. A few short fringes were found attached to under surface of capsule.

Stitches removed on eighth day. In addition to the routine treatment, rubber dam was used at night.

Discharged Nov. 18, 1903.

Massage to thigh and calf continued at Out-Patient Department for several weeks.

April 4, 1904. Patient presents symptoms of foot strain. Plates, showers and exercises.

Aug. 31. Small amount of swelling present for some time, situated to left of the patella. A chart of the fluctuation in size of the knee at Out-Patient Department suggests a hydrops articuli of the intermittent type.

CASE 39. F. A. L., male, twenty-eight, married. Operation, April 29, 1904.

Numerous villi found, in greatest abundance as a