

reaction was positive. In several of these cases there were argument and divergence of opinion relative to the possible presence of complicating factors, such as epilepsy, gross sclerotic lesions, and toxic conditions secondary to heart and kidney disease. In spite of this, a definite preference for paresis as the basic condition was expressed by every one present at the conference.

There were six other cases which some of the staff members believed to be paresis, but concerning which the opinions were not unanimous. When these patients were examined microscopically at necropsy, none of them showed evidences of cerebral syphilis. It is also interesting to observe that five of these six patients failed to give positive serologic signs of syphilis in either the blood or the spinal fluid, and that the sixth patient died before any specimens for laboratory tests could be obtained.

I believe that many errors are made by placing too much dependence on one laboratory examination of the blood and spinal fluid. Several workers have drawn attention to the fact that the blood of a syphilitic will frequently be found negative to the Wassermann reaction at one time and positive at another. The records of the Warren State Hospital show many instances of this and also numerous similar irregularities in the findings in the spinal fluid examinations. Because of this recognized liability to variation in serologic findings, all the physicians presenting cases before the hospital staff have been very careful to have several specimens of blood and spinal fluid examined in all questionable cases before asking the staff to aid in the final classification, and this has, without doubt, aided materially in making accurate diagnoses.

These findings confirm the opinion that I expressed⁵ in 1915, namely, that with the aid of modern laboratory methods, probably 100 per cent. accuracy could be obtained. It does not necessarily follow that this high percentage could be maintained indefinitely; but the facts presented in this study prove that the error in diagnosing neurosyphilis of the parietic type can be made almost negligible if a careful clinical examination is combined with repeated serologic tests made by a competent laboratory worker.

5. Weston, P. G., and Darling, I. A.: Am. Jour. Insan., 1915, 72, 325.

School Lunches.—Along with other sociologic problems of increased importance during the war, the subject of school lunches for children in the large cities, particularly, has been the subject of augmented interest. The New York School Lunch Committee, maintained by the New York Association for Improving the Condition of the Poor, has published information concerning the work of the committee in New York, where lunches are provided in thirty-five of the 208 schools of the city. On account of the increased cost of everything, the price of the dishes of these lunches has had to be raised somewhat, and still the income has not equaled the expenditure for food and service, to say nothing of the cost of equipment. The income from lunches in thirty-four of the schools during the period from 1916 to 1917 was \$38,369.81, while the operating costs, including capital expenditures, amounted to over \$60,000, leaving a deficit of nearly \$22,000. The need for this work has been demonstrated, and its good results have been apparent not only in the benefit derived by the children, but also in the example set for the parents at home, where diet conditions have been improved. The committee says that there is an almost universal belief among those who have seriously considered the problem that school lunch work is school work and should be taken over by the board of education. Heretofore, the funds have come from public-spirited citizens.

THE PRESENCE OF SPIROCHETES IN THE KIDNEY*

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In May, 1917, at Tokyo, Futaki demonstrated spirochetes in the urine and the renal casts of typhus-infected kidneys, and reported them as the specific causative agent of typhus fever. Two months later, Futaki's report was discussed by Miyashima, Kusama and Koga. Miyashima and Kusama had not been

TABLE 1.—CASES EXAMINED AT NECROPSY

| No. | Age | Sex* | Diseases | Spirochete |
|-----|-----|------|---|------------|
| 1 | 10 | ♂ | Chronic nephritis..... | + |
| 2 | 18 | ♂ | Tuberculous appendicitis; caries of ileum..... | + |
| 3 | 20 | ♂ | Acute nephritis; uremia..... | ++ |
| 4 | 20 | ♂ | Chronic nephritis..... | + |
| 5 | 20 | ♂ | Pulmonary tuberculosis..... | — |
| 6 | 21 | ♂ | Tetanus..... | — |
| 7 | 22 | ♂ | Suppurative appendicitis, peritonitis and acute nephritis..... | — |
| 8 | 23 | ♂ | Nephrolithiasis; uremia; hemorrhagic nephritis..... | + |
| 9 | 25 | ♀ | Pulmonary tuberculosis; acute nephritis..... | + |
| 10 | 27 | ♂ | Chronic nephritis..... | + |
| 11 | 28 | ♂ | Chronic parenchymatous nephritis..... | ++ |
| 12 | 28 | ♂ | Suppurative oophoritis..... | + |
| 13 | 28 | ♂ | Suppurative nephritis..... | + |
| 14 | 29 | ♂ | Valvular endocarditis..... | + |
| 15 | 30 | ♂ | Chronic nephritis..... | — |
| 16 | 31 | ♂ | Valvular endocarditis..... | — |
| 17 | 32 | ♂ | Multiple cystic kidney..... | ++ |
| 18 | 37 | ♂ | Diabetes mellitus; chronic nephritis..... | + |
| 19 | 38 | ♂ | Puerperal nephritis..... | — |
| 20 | 40 | ♂ | Parenchymatous nephritis..... | + |
| 21 | 41 | ♂ | Chronic nephritis..... | + |
| 22 | 44 | ♂ | Acute nephritis; septicemia..... | — |
| 23 | 45 | ♂ | Multiple cicatrization of the kidney..... | — |
| 24 | 46 | ♂ | Contracted kidney; pyemia..... | — |
| 25 | 47 | ♂ | Pulmonary tuberculosis; chronic parenchymatous nephritis..... | — |
| 26 | 47 | ♂ | Pulmonary tuberculosis; acute parenchymatous nephritis..... | + |
| 27 | 47 | ♂ | Hepatic cirrhosis; hepatic carcinoma..... | — |
| 28 | 54 | ♂ | Lead intoxication; chronic nephritis..... | — |
| 29 | 54 | ♂ | Hepatic carcinoma; contracted kidney..... | — |
| 30 | 54 | ♂ | Ulcerative endocarditis of aortic valves..... | + |
| 31 | 54 | ♂ | Hepatic cirrhosis..... | — |
| 32 | 55 | ♂ | Chronic nephritis..... | — |
| 33 | 61 | ♂ | Gastric carcinoma; chronic nephritis..... | + |
| 34 | 61 | ♂ | Chronic nephritis..... | — |
| 35 | 61 | ♂ | Chronic nephritis..... | + |
| 36 | 62 | ♂ | Gastric carcinoma; chronic nephritis..... | + |
| 37 | 64 | ♂ | Contracted kidney..... | + |
| 38 | 65 | ♂ | Suppurative nephritis..... | + |
| 39 | 69 | ♂ | Contracted kidney..... | + |
| 40 | 72 | ♂ | Cerebral apoplexy; chronic nephritis..... | — |
| 41 | 72 | ♂ | Sarcoma of the leg; phlegmon; hemorrhagic nephritis..... | + |
| 42 | 76 | ♀ | Contracted kidney..... | — |
| 43 | 77 | ♀ | Chronic nephritis..... | — |
| 44 | 80 | ♀ | Valvular endocarditis; congestive induration of the kidney..... | + |
| 45 | .. | .. | Acute parenchymatous nephritis..... | — |
| 46 | .. | .. | Contracted kidney..... | — |
| 47 | .. | .. | Contracted kidney..... | — |
| 48 | .. | .. | Congestive induration of the kidney..... | — |
| 49 | .. | .. | Multiple cystic kidney..... | ++ |
| 50 | .. | .. | Contracted kidney..... | — |

* In this column, ♂ denotes male and ♀ female.

able to find any spirochetes in the kidneys or other organs of experimental typhus-infected animals (rabbits and guinea-pigs). Koga had found many spirochetes (the *Spirochaeta smegmatis*?) in the urine of patients suffering from different diseases and also in healthy persons, but he could not find any points in which morphologically the spirochetes differed from the spirochetes of Futaki. There was, however, a stronger pulse than in the presence of spirochetes in the kidneys. For control examination, we observed many kidneys, which were mostly affected

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by acute and chronic nephritis, in which casts were present. These we stained by Levaditi's method. We found many silver-stained spirochete-like bodies in the casts of kidneys in different diseases. It may be said, therefore, that the question of the presence of spirochetes in the kidneys in various diseases other than typhus fever is such an interesting problem that more attention should be paid to it. We have examined many kidneys in both dead and living bodies harboring various diseases, and we here record the results of our observations.

We have examined fifty kidneys of dead bodies and twenty-six of living bodies in the course of operation and found spirochetes in twenty-five of the former and in fifteen of the latter. The results are set forth in the accompanying tables.

The spirochetes in the kidney were found mostly in hyaline casts, hyaline clots and also in the granular substance of the cortex, but not so many were found in the medullary substance. We have also noticed two cases of hyaline clots in Bowman's capsule, and two cases of homogeneous and granular casts in con-

yet given satisfactory results. Occasionally we have noticed brown-stained irregular spiral forms in the silver-stained preparation, but it cannot be said that the mere finding of spiral forms is an evidence of the presence of true spirochetes. The presence of the spiral bodies in question which were morphologically difficult to differentiate from true spirochetes, without being related to any definite disease, is a very important fact.

In 1912 Le Play, Sézary and Vallery-Radot¹ found spirochetes in the kidney. Their report is very interesting, as the spirochetes they found seem to resemble our spirochetes. Le Play examined the kidneys in question according to Bellitali and Vorpino's method and found black-stained filament bodies in the casts and exudate of the excretory and secretory ducts in cases of tuberculosis, arteriosclerosis, and lead intoxication associated with acute or chronic nephritis. There were, however, absolutely no suspicious signs of any syphilitic changes in the history of the case, nor in the Wassermann reaction, nor at the necropsy. The filament bodies much resembled *Spirochaeta pallida* and were found mostly isolated or else in groups in the cortical substance, but they were not found at all in the interstitial tissue, glomeruli or blood vessels. They were named *Pseudotreponema*. They were very much like the *Spirochaeta pallida* found in the urine of syphilitic patients, as reported by Hirschberg, McLennan, Dreyer and Toepel, and Barth and Michant; also in syphilitic kidneys, as reported by Le Play and Sézary, and by Faroy. For this reason, Le Play said that attention must be paid to spiral bodies in the urine and the kidneys. Ours and Le Play's spirochetes very much resemble one another and cannot be found elsewhere. It is difficult to assert, therefore, that the spirochetes found in the urine or in the renal casts are the specific causative agents in definite diseases and also in other spirochetal diseases. By means of dark field illumination and Giemsa's staining method, we examined centrifugalized casts in the urine of several nephritic patients and experimental nephritic animals, but none of the observations brought any satisfactory results.

TABLE 2.—CASES EXAMINED AT OPERATION

| No. | Age | Sex* | Diseases | Spirochete |
|-----|-----|------|-------------------------------|------------|
| 1 | 20 | ♀ | Left tuberculous kidney..... | + |
| 2 | 24 | ♀ | Left tuberculous kidney..... | + |
| 3 | 27 | ♀ | Right tuberculous kidney..... | — |
| 4 | 28 | ♀ | Left tuberculous kidney..... | + |
| 5 | 31 | ♀ | Tuberculous kidney..... | — |
| 6 | 34 | ♀ | Right tuberculous kidney..... | + |
| 7 | 35 | ♀ | Left tuberculous kidney..... | + |
| 8 | 38 | ♀ | Nephrolithiasis..... | — |
| 9 | 40 | ♀ | Left tuberculous kidney..... | + |
| 10 | 41 | ♀ | Right tuberculous kidney..... | + |
| 11 | 54 | ♀ | Left tuberculous kidney..... | + |
| 12 | .. | ♀ | Right tuberculous kidney..... | + |
| 13 | .. | ♀ | Right tuberculous kidney..... | + |
| 14 | .. | ♀ | Right tuberculous kidney..... | — |
| 15 | .. | ♀ | Left tuberculous kidney..... | + |
| 16 | .. | ♀ | Hydronephrosis..... | + |
| 17 | .. | ♀ | Left tuberculous kidney..... | — |
| 18 | .. | ♀ | Right tuberculous kidney..... | + |
| 19 | .. | ♂ | Tuberculous kidney..... | — |
| 20 | .. | ♂ | Left tuberculous kidney..... | + |
| 21 | .. | ♂ | Tuberculous kidney..... | + |
| 22 | .. | ♂ | Tuberculous kidney..... | — |
| 23 | .. | ♂ | Left tuberculous kidney..... | — |
| 24 | .. | ♂ | Right tuberculous kidney..... | — |
| 25 | .. | ♂ | Tuberculous kidney..... | + |
| 26 | .. | .. | Right tuberculous kidney..... | — |

* In this column, ♂ denotes male and ♀ female.

genitally cystic kidneys. In contracted kidneys, we found spirochetes in the so-called cysts of retention. The location of the spirochetes in the casts of the urinary tubules was not always constant. In the same cases, we occasionally found only hyaline clots, but no other clots, and in from ten to twenty preparations we also found a few of them.

The spirochetes we found we stained a deep black, according to Levaditi's method. They formed delicate spiral curved organisms, their average length being from 6 to 10 microns. The smaller forms were from 4 to 5 microns in length. Organisms 22 microns long have been observed, both ends of which are pointed. Morphologically, they may be divided into three types. Type I is much like the *Spirochaeta pallida*, particularly in its spiral form. Type II shows an irregularly curved spiral, while Type III is much broader than Type I or II, and its curves are much coarser and less regular.

What is the origin of our spiral bodies? If they were true spirochetes, they could be determined only by more minute examination, namely, by dark field illumination as living bodies and by Giemsa's staining as final objects. Our examinations, however, have not

SUMMARY

1. By Levaditi's method we have found many spirochetes in the hyaline casts and hyaline substances in urinary tubules, without relation to any diseases. Further and more minute attention must therefore be paid to the study of spirochetes in the kidneys.

2. Our spirochetes are found not only in the casts, but also in the hyaline or granular substances located in the cortical substances, in urinary tubules, in Bowman's capsule, and in cysts. But they have not yet been found in the blood vessels, in the interstitial tissues, or in the cells.

3. Our spirochetes may be divided into three types.

1. Le Play, A.; Sézary, A., and Vallery-Radot, P.: Compt. rend. Soc. de biol., 1912, **73**, 635.

Obligation to Care for the Child.—The war cloud dims our vision of the facts at home. But in war or peace, there is this constant struggle for a living and a life. Today it is the mother in her distress that needs help and care; tomorrow it is the infant new-born; the third day it is the talking and walking child. For, whenever the one or the other is found, the tale of inadequate service, of danger, of damage, of disease and death is nearly the same, varying a little in local color but never in substance.—Dr. Leslie Mackenzie, Report on Scotland to Carnegie United Kingdom Trust.