be better to describe as a corrected position; and, in addition, I hope, a greater degree of immobilization. This appliance is always under control, and enables one to see that the patient receives proper care of the skin. Our experience has been most gratifying in the treatment of these cases. I may have been more fortunate than most. We are going through this experience with some cases now. The ultimate fact to be looked for is continuous improvement, even though slow. So long as that is going on, I feel that we are moving in the right direction.

Dr. C. M. JACOBS, Chicago: I do not deny that some patients get well; but what I have tried to bring out is that when this occurs the pathologic lesion is a tuberculous granulation tissue rather than an intraspinal abscess. We know that most children with Pott's paraplegia get well; on the other hand, my records show that out of twenty-four adult cases, sixteen were known to end fatally. Children with Pott's paraplegia are placed on a Bradford frame, with or without traction, and as already stated they usually get well. The roentgenograms in these cases do not show a shadow indicating abscess. When the roentgenograms show abscess formation there is more or less permanent paralysis. At the Home for Crippled Children, I have two patients with Pott's disease who have been paralyzed for the past two years. I

NEURITIS AND PARALYSIS AS A COMPLICATION OF THE INTENSIVE PASTEUR TREATMENT

J. C. GEIGER, M.D.

Assistant Director, Bureau of Communicable Diseases of the California State Board of Health

BERKELEY, CALIF.

Remlinger,¹ Stimson,² Simon,³ Hasseltine⁴ and Fielder,⁵ in a summary of the literature with a report of their personal cases, show the sum total of paralysees following the Pasteur treatment to be 142, with twenty-four deaths. With the additional cases described in Table 1, the number of paralysees is increased to 150, without taking into consideration the seven cases reported as neuritis. Attention is particularly called to the two cases of optic neuritis heretofore not described in the literature. With the etiology of this complication very much in doubt, it is best that one call attention to the seemingly important factors of the cases in this series.

TABLE 1.—PARALYSES

Case	Diagnosis in Biting Animal Based on Negri Bodies or Inoculation; Observed Symptoms; Suspicious History	Onset Days After		Site of Involvement	Time of Recovery
		Bite	Beginning Treatment		
1	Treatment taken as a precautionary measure	21	17	Unilateral facial paralysis.....	Traces 9 months later
2		..	28	Partial paralysis legs; considerable diarrhea present.	Six weeks
3		21	15	Paralysis legs; partial paralysis arms and face sphincters	Partial recovery 3 weeks later
4	+	24	17	Paralysis both legs; cerebrospinal fluid withdrawn and inoculated subdurally into guinea-pigs, with negative results	Several weeks later
5	+	18	18	Bilateral facial paralysis, with involvement of lower limbs, sphincters, and, to a smaller extent, the arms; prodromal symptoms of extreme nausea and severe local reactions, with rise of temperature	Traces 16 months later
6*	Dog well; treatment taken as a precautionary measure, and self-administered	12	10	Paralysis both legs and sphincters; simultaneous with the beginning of involvement of nervous system there was a "flaring up" of all previous local reactions with a sharp rise in temperature	Traces 7 months later
7*	Pricked on thumb with needle while administering the Pasteur treatment	..	17	Paralysis of legs.....	Several months
8	+	..	17	Paralysis of legs and sphincters; severe local reactions after each injection, the paralysis following unusually severe ones; no rise of temperature	Reported slowly improving four months later

* Physician.

have tried in every way to modify the condition by different methods—particularly with rest, but without success. The roentgenograms show a shadow which I have diagnosed as an intraspinal abscess. According to my observation, Pott's paraplegia in adults, due to intraspinal abscess, is usually followed by complications such as pulmonary tuberculosis, bronchopneumonia or tuberculous meningitis. Dr. Sayre did not state whether roentgenograms were taken of his cases and if so, whether a shadow was shown indicating abscess formation.

Dr. SAYRE: In both of my cases I believe that there was an abscess present, because, after the disappearance of the paraplegia, abscesses showed themselves—in one case, in the spine, and in the other, in the groin. These abscesses were opened and washed out, and disappeared.

Dr. HIBBS: These were intraspinal abscesses, not ordinary abscesses?

Dr. SAYRE: I believe that these abscesses had their origin in the spinal canal, as the result of a process going on in the vertebra and elsewhere in the canal. They exerted enough pressure to cause paraplegia. Then, before they were done, they became extraspinal abscesses; and, with relief of pressure in the canal, the paralysis disappeared. This does not occur in all cases, but did in these.

STUDY OF CASES

1. The percentage of involvement of the central nervous system including the cases of neuritis in the series of intensive Pasteur treatments in which these cases occurred, numbering approximately 1,600, was 0.9 per cent. This percentage is in excess of what is usually reported, and would lead one to believe that many cases go unrecognized. Considering the paralysees alone, the incidence was 1:200 in those treated in this series.

2. No children were affected. It is of interest to note that Cases 6 and 7 were in physicians.

3. The paralysis occurred in one person (Case 2) who was not bitten. Again, it occurred in one person

1. Remlinger: Accidents paralytiques au cours du traitement antirabique, Ann. de l'Inst. Pasteur, 1905, 19, 625.

2. Stimson, A. M.: Facts and Problems of Rabies, Bull. 65, Hyg. Lab., U. S. P. H. S., 1910.

3. Simon: Ueber Lähmungen im Verlauf der Tollwutzschimpfung, Centralbl. f. Bakteriologie, Orig., 1913, 68, 72.

4. Hasseltine, H. E.: Paralysis During Antirabic Treatment, Pub. Health Rep., Oct. 24, 1913, p. 2220; *ibid.*, July 30, 1915, p. 2226.

5. Fielder, F. S.: Paralysis During Pasteur Antirabic Treatment, THE JOURNAL A. M. A., June 3, 1916, p. 1769.

(Case 6) who was bitten, but not by an animal which was rabid.

4. Cases 4, 5 and 6 were treated with the same set of virus with fifteen others. This virus was checked culturally, aerobically and anaerobically, with sterile results. From these cases one would be led to believe that there was some idiosyncrasy on the part of the ones affected. An idiosyncrasy not being a complete explanation, one would consider the symptoms presented as a result of fixed virus infection.

5. In Cases 2, 5 and 6, observed personally, one would be apt to judge the patients as having such temperaments as to predispose to some involvement of the nervous system.

6. In Cases 2, 3, 4, 5, 6, 7 and 8, the condition was apparently a myelitis, yet in others the peripheral nerves seemed most involved. Facial paralysis alone was noted in one case (Case 1). There is no doubt that bulbar symptoms were present in Case 5. The involvement may be of a selected nature, as shown by Cases 11 and 13.

7. In Case 3, though the treatment was discontinued and resumed with no ulterior results, I am convinced

one thirteen days, in one fifteen days, in three seven-teen days, and in one twenty-eight days.

COMMENT

There is no doubt that in some persons to whom the intensive Pasteur treatment is administered, 0.9 per cent. in our series, taking into consideration the cases of neuritides presented, there occurs some involvement of the nervous system, with possible serious results. Therefore the intensive Pasteur treatment is not without danger, and warning should be given accordingly.

This involvement may be of the nature of a definite myelitis which is most probably rabic. The short incubation period as demonstrated in the cases reported here seems characteristic of fixed virus, yet it must be remembered that comparatively as short an incubation period is seen in cases of human rabies,⁶ as a result of street virus infection, overwhelming in every instance. No single etiologic factor can explain every case, as in Case 6 in my series. The patient was not bitten by a rabid animal. Either theory—an idiosyncrasy anaphylaxis, or fixed virus—is applicable to this case. Though continuation of the Pasteur treatment in some of the cases of paralyses may not appreciably affect the course of the disease, in others it may be fraught with grave danger, as illustrated by Case 6.

TABLE 2.—NEURITIDES

Case	Diagnosis in Biting Animal Based on Negri Bodies or Inoculation	Onset Days After		Site of Involvement	Time of Recovery
		Bite	Beginning Treatment		
9	+	34	31	Spasmodic contraction muscles side of neck	Several weeks
10	+	48	45	Spasmodic contraction muscles side of neck	Several weeks
11	+	23	19	Double optic neuritis followed by complete blindness of a few days' duration	7 weeks
12	+	34	30	Severe pains left eye, later affecting side of face, occurring at intervals	2 weeks
13	+	21	17	Double optic neuritis followed by complete blindness with gradual recovery of vision	Several weeks
14	+	..	..	Continuous vomiting.....	Immediate
15	+	21*	18*	Extreme numbness of fingers and toes with some extension to arms and legs	Several weeks

* Contact

from observations of Cases 5 and 6 and the alarming symptoms presented that the continuation of the treatment was bad judgment. There must be a border line, so to speak. The latter cases around the seventh day of treatment presented definite prodromal symptoms of nausea and temperature. In Case 6 the treatment was discontinued for two days, with a return of the patient's condition to normal. The resuming of the treatment brought on an immediate and much aggravated return of the initial symptoms coincident with the appearance of the paralysis.

8. One can easily grant that the local reactions observed during the course of the Pasteur treatment are an indication of the individual's hypersusceptibility to foreign proteins. Then the flaring up of these reactions simultaneously with the beginning of the symptoms of involvement of the nervous system observed in Case 6, and to a lesser degree in Case 8, is most interesting. These cases readily support the anaphylactic theory.

9. The shortest incubation period of the paralyses was ten days. In one instance it was twelve days, in

THE HECHT-WEINBERG-GRADWOHL TEST IN THE DIAGNOSIS OF SYPHILIS

ITS SUPERIORITY OVER THE WASSERMANN TEST IN
UNTREATED AND TREATED SYPHILITICS*

R. B. H. GRADWOHL, M.D.

ST. LOUIS

It has taken about one decade to introduce the Wassermann test into the field of diagnosis. It is now recognized as one of the most valuable laboratory aids that has yet been brought into routine use. It is so nearly specific in differentiating between syphilitic and nonsyphilitic conditions that for all practical purposes we may conclude that a positive Wassermann means syphilis.

This reaction is usually performed by competent workers along the lines originally laid down by Wassermann and the so-called Berlin school of serology. As a pupil and follower of that school I have insisted on the carrying out of a technic similar in all details to that originally advocated by Wassermann, with the exception of replacing the watery extracts of antigenic substance by one or more of the much superior alcoholic preparations. Using, therefore, the so-called "classical Wassermann" with the proper alcoholic antigen, cholesterinized or not as the case may be, I have seen every phase of the development of this reaction, and have watched it from the standpoint, not only of the laboratory, but also with the interest of a clinical observer in syphilis. With this experience I have long since come to recognize in this test a splendid method of syphilitic diagnosis and at the same time have come to regard its negative presence in many instances as a sore disappointment in clinching a diagnosis in which almost absolute clinical evidences of the disease were at hand. In other words, like others, I have long since

6. Geiger, J. C.: Human Cases of Rabies in California and Their Treatment, California State Jour. Med., June, 1916.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.