

## NEUROSYPHILIS IN EX-SERVICE MEN.

By ASSISTANT SURGEON (RESERVE) R. H. PRICE,

U. S. PUBLIC HEALTH SERVICE HOSPITAL, NO. 49, PHILADELPHIA, PA.

The cases of neurosyphilis treated at the U. S. Public Health service Hospital No. 49, Philadelphia, Pennsylvania, have thus far been limited to discharged soldiers, sailors, and marines. It is certain that these men were accepted as physically and mentally fit for military service, and, since they developed symptoms of nervous or mental disease, either during or soon after their war experiences, it would be unreasonable to assume that the malignant manifestations of lues would have developed had the men remained in their usual environments. It is therefore conceded that the cases of neurosyphilis observed have been incident to military service.

Although it is the accepted belief that neurosyphilis is always due to infection by the *Treponema pallidum* no one claims to know just how much effect certain coexisting conditions have upon hastening the development of the active invasion of the nervous system by that organism. For instance, Menninger concluded that latent syphilis, plus influenza, equals neurosyphilis. Though he may have been right in his assumption of the correctness of his equation so far as the particular cases observed were concerned, one must always keep in mind that many individuals have syphilis and influenza simultaneously and yet escape neurosyphilis. Furthermore, while it is probable that the military service of many of our patients was the exciting factor in the production of unfavorable nerve tissue reaction and the invasion by the spirochaete, nevertheless no means are at hand to determine which cases would or would not have developed neurosyphilis had they remained in civil life.

On the other hand, it is probable that many men with latent syphilis were subjected to great mental and nervous stress under military training or modern conditions of warfare and not infrequently were affected by head trauma and infectious diseases, without the production of neurosyphilis. Fordyce states that syphilis of the nervous system probably begins within a year after the occurrence of the primary lesion and that the number of cases during that early period corresponds roughly with the total number of cases of so-called late neurosyphilis. If this view is accepted, then it must

seem probable that some of the patients with neurosyphilis treated at the U. S. Public Health Service Hospital No. 49 have had neurosyphilis with few or no symptoms before they engaged in military or naval activities.

The symptomatology and serology of the disease occurring in ex-service men is probably identical with any other similar group of patients. In the cases observed, however, the average age with which the symptoms became noticeable was thirty-three years. The apparent precocity of onset is quite probably due to the low average age of the personnel of the U. S. Army and Navy during the late war.

Neuropathologists have called attention to the fact that it is impossible to correlate the degree and scope of anatomical changes with the symptomatology of neurosyphilis. It is quite generally accepted, however, that neuro-structural changes always occur and that spirochaetes always invade nerve tissue to a greater or less degree. However, it is usually difficult and quite generally impossible to determine by neurological and mental symptomatology alone the severity or scope of nerve tissue destruction. Thus the symptomatology may be due in a large measure to altered function of nerve cells resulting from toxicity, pressure of exudate, or conditions which interfere with the blood supply or other forms of nerve cell nutrition.

The specific treatment for neurosyphilis has been regarded in some quarters as a hopeless therapeutic measure. The purely custodial form of treatment, however, has met with little favor at the U. S. Public Health Service Hospital No. 49, Philadelphia, Pennsylvania. Much has been written regarding the value of arsenic, mercury, and iodides in the treatment of this grave form of lues. In the past few years much work has been done along the lines of intravenous, intraspinal, and intraventricular treatment of this condition. Some physicians, in discussing the specific treatment of neurolues, often refer to the so-called remissions that are liable to occur during the course of a treated or untreated paresis. There is nothing miraculous in the temporary slight improvement shown in such cases when not under specific treatment because the body is constantly attempting to overcome the destructive work of the spirochaete and is often able to show brave efforts in this direction. However, it is a well known fact that the outcome is unfavorable unless such individuals are aided in the struggle by medical therapy. Such has been the policy in the treatment of neurosyphilitic cases coming under the observation of the U. S. Public Health Service Hospital No. 49. It seems not out of place at this point to briefly review some of the

work accomplished by others in the specific treatment of neurosyphilis and to then briefly outline the results of such therapy among ex-service men.

Solomon, in 1916, published statistics regarding 50 systematically treated cases of general paresis. Clinical remissions occurred in 68% of the cases and 32% were clinically unimproved. Of the 68% with clinical remissions, 8% showed during the remission, negative cerebrospinal fluid findings, 32% showed weaker spinal fluid findings, and in 28% it was unaltered. Of the 32% clinically unimproved, 18% showed unaltered cerebrospinal fluid. These cases had been treated at least two years before the statistics were published. The present author was given the opportunity of studying these patients and it seemed probable that the infective agent was destroyed in many cases, as the progress of the disease appeared arrested and many of the group are now earning a living and are useful citizens in the community. Nevertheless, the patients did not become absolutely normal, as certain abnormal neurological findings with reference to pupillary changes and speech disturbances persisted. Their mentality is also obtunded.

Dercum and Gilpin have published articles during the past two years in which they state that though they obtained good results from the injection of medicated serum intraspinalously, it was their opinion that the repeated spinal drainages (together with the induction of medication by channels other than the intraspinalous) were responsible for the beneficial results.

Lately Fordyce, Stokes and Osborne have attempted to refute Dercum and Gilpin's theory, claiming that intraspinal medication is more effective than spinal drainage. It is worthy of note that both groups of opposing authorities have based their results upon clinical and serological findings, as well as citing diverse physiological theories concerning the spinal fluid treatment. In the cases cited in their respective papers, Dercum and Gilpin used first the Swift-Ellis treatment, then the spinal drainage; whereas, Fordyce, Stokes and Osborne changed from the spinal drainage to the Swift-Ellis treatment in their cases. It is, therefore, probable that the question of relative effectiveness of the two methods is not definitely settled.

Lowrey, who had much experience with all forms of treatment for neurosyphilis, including the intra-ventricular method, states in a personal communication of recent date the following:

"With respect to the treatment of neurosyphilis, I still believe that the most efficacious method of treatment is the intensive intravenous method. Intraspinalous therapy is, in my opinion, chiefly of

value in early cases of tabes suffering from much pain. It is a question whether the diarsenol is the valuable thing in this treatment, or whether it is the introduction of foreign serum. I do not myself believe that any particular method or scheme of treatment will always work. I think, therefore, that spinal drainage may be of some assistance in favorable cases; that is, in cases that would react well to any method of intensive treatment, and of absolutely no assistance in the other cases. In other words, I believe the theory of it is sound, but that there is no 100 per cent or even 75 per cent method for the treatment of paresis, unless the cases are always gotten early, preferably before the outbreak of clinical symptoms, and even then the results will depend in part at least, upon the location and type of the most advanced lesions."

More than eighty cases of neurosyphilis have been treated at the U. S. Public Health Service Hospital No. 49; forty-two of these are still under care; the others have either been discharged or transferred to other institutions. Besides the hospital patients, cases of neurosyphilis are being treated at the U. S. Public Health Service Hospital No. 49, under the direction of A. J. Ostheimer, Surgeon (Reserve), Chief of the Neuro-Psychiatric Section, Third District, Veterans' Bureau. These out-patients remain at their homes, reporting at the hospital for treatment.

The following method of treatment is being used at the U. S. Public Health Service Hospital No. 49:

The patient is given a six weeks' course of neosalvarsan intravenously. Mercurial inunctions and potassium iodide are also administered. Following the intravenous medication, spinal drainage is instituted. In addition to these specific measures, special attention is given to the regulation of diet, excretion, exercise, and occupation. In order to improve the general physical tone, hydro- and electrotherapy are utilized, the principle being to treat the case rather than the disease.

In regard to the spinal drainage treatment, the greatest difficulty is encountered in securing the coöperation of patients who have been hurt during previous spinal punctures. Fordyce gives the excellent advice to do lumbar punctures in all cases of primary and secondary syphilis, before the patients are discharged as cured. It might be well to add to his suggestion that extreme caution should be taken to prevent pain during the procedure, because many first punctures have caused such suffering in patients that they have dreaded a repetition of the operation. During the courses of treatment at U. S. Public Health Service Hospital No. 49, the lumbar

puncture needle is never inserted more than once in an attempt to secure drainage. If unsuccessful, the withdrawal of fluid is postponed until a later time for the sake of the patient's comfort.

The author is of the opinion that in repeated spinal drainages, the oblique or diagonal mode of puncture is capable of unpleasant results. When that method is used the operator frequently strikes nerves, causing excruciating pain to the patient. It is possible that repeated nerve trauma of this sort might cause actual damage to the nerves affected.

It is probable that a case of syphilis of the nervous system should be treated for at least two years before any positive statement is made regarding the eventual outcome or value of specific therapy. It seems best, then, to consider in this preliminary report only those patients who were treated for at least one year. Of the twelve cases regularly treated for one year or more, four can be said to have shown absolutely no clinical improvement; two of the latter were so resistive that the spinal drainage therapy could not be conducted. The improved patients have shown various degrees of change for the better, physically, or mentally, or both. No one can be said to have actually recovered. It must be remembered, however, that even had the cases remained stationary the therapy would not necessarily have been ineffective, since we are dealing with a disease which is usually progressively fatal in its course. The blood Wassermann has become negative in three cases; spinal fluid Wassermann is now negative in two cases; and both the blood and spinal fluid Wassermans are negative in one case; in this latter all of the other spinal fluid findings are negative. Three patients have parole of the hospital grounds. It is questionable whether they could be cared for at home because of their liability to indulge in various excesses which might impede their treatment.

In the spinal fluid of the twelve patients treated regularly by spinal drainage for a year or more, only two have shown no reduction in the gold curve and cell count. The pleocytosis was reduced much sooner than the gold curve. It is worthy of note that it required three months to produce any great change in the gold reaction. In the recent work in the Mayo Clinic from which Stokes and Adams drew their previously mentioned conclusions, the patients were given spinal drainage therapy, averaging five weeks' duration in each case. If our results had been checked up after five weeks' treatment, striking changes in the gold curves would not have been noted, showing that only lengthy trials will determine the value of various forms of therapy.

It is regretted that definite results in treatment cannot be stated in regard to the rest of the eighty cases treated. The amount of work upon them represents a total of 1579 Wassermann examinations, 868 spinal punctures; and 1356 intravenous injections of arsenic preparations in less than one year. Since these cases have been under treatment for such a short period it is too soon to draw any definite conclusions as to the outcome. However, it may be stated that one could not become optimistic in regard to the prognosis of neurosyphilis from observation of these eighty cases, for after all, the only way to do really helpful work in regard to this dread disease is to prevent it. The pitiful point is that had the treatment of primary and secondary syphilis been thoroughly given, the neuro-lues might never have occurred.

TABLE 1  
GOLD CURVE AND CELL COUNTS BEFORE TREATMENT AND AFTER TREATMENT FOR ONE YEAR

CASE NUMBER	1	2	3	4	5	6
Cell Count when patient admitted to hospital.....	33	22	41	30	44	27
Cell Count after treatment for one year.....	3	4	1	2	3	7
Gold Curve when patient admitted to hospital.....	5544311000	5555532100	555553100	4333210000	5555543100	5554310000
Gold Curve after treatment for one year.....	0001110000	0123321000	0000000000	1223343210	2233332100	0011221000

CASE NUMBER	7	8	9	10	11	12
Cell Count when patient admitted to hospital.....	15	18	30	12	60	14
Cell Count after treatment for one year.....	5	22	2	14	55	1
Gold Curve when patient admitted to hospital.....	555553210	555554310	4433321000	5555531000	5555543100	5555432210
Gold Curve after treatment for one year.....	2333321100	2444333210	0012321100	5555431000	4455432210	2233321100