

the blood and lymph streams. 5. Edema of the interstitial tissue and degeneration and destruction of the ganglion cells are always present. 6. The vessels are congested, their walls degenerated and the capillary branches in the gray matter irregularly distended and often ruptured, giving rise to hemorrhages, which always intensify markedly the amount of destruction. Thrombosis was not observed. 7. Early degeneration of nerve fibers from the anterior roots is a constant feature. 8. Stains for micro-organisms were uniformly negative." The bacteriologic part of the report is made by Dr. Chesley. The observations and experiments appear to have been made with great care. Both lumbar puncture and specimens from autopsies were employed, as well as one inoculation into a monkey and numerous similar ones in rabbits. The experimental work confirms the opinion already expressed by other observers that Geirsvold's diplococcus is not a causative factor in the disease. The authors look forward for the solution of the etiologic problem by the workers of the Rockefeller Institute, whose labors have already been so fruitful in enlightening us as to this disease.

INFANTILE SPINAL PARALYSIS.

The surgical treatment of infantile poliomyelitis is described by D. Silver, Pittsburg, Pa. (*Journal A. M. A.*, September 17). The objects of operation are given by him substantially as follows: First, improvement of form in the paralyzed member by forcible correction (tenotomy, fasciotomy, myotomy, osteotomy, wedge-shaped excision of bone and bone excavation). Second, improvement of function in the non-deformed or corrected member: A, through restoration of power to the paralyzed muscle by nerve anastomosis; B, restoration of muscle balance by muscle and tendon grafting and transplantation; and C, through securing greater stability in the paralyzed member by arthodesis, astragalectomy, silk ligaments, tenodesis, fasciodesis and removal of skin flaps. Each of these is taken up in detail.

There is deformity in the majority of patients, and while this can be largely corrected by early, proper and persistent use of passive motion and retention apparatus, in the majority of cases it has been allowed to become more or less permanent. Any operation for the correction of this necessarily includes long-continued over correction. The use of forcible correction, tenotomy, etc., depends on the mechanical conditions to be met and the degree to which passive motion and mechanical appliances have failed. The reduction of deformity in many cases will tend to functional improvement, and with the aid of apparatus and muscle training further operative treatment may not be necessary. For the improvement of function we have first, restoration of power to the paralyzed muscle by nerve anastomosis, but this has a more limited utility than the first enthusiasm for the operation seemed to expect. A study of the literature does not indicate that ideal results are so frequent as was at first thought to be the case. The earlier the operation the better the chance of success, as the muscle degenerates and it must be remembered that there is chance of injury to a healthy nerve by the method. Over-correction of a deformity is a necessity, and this should be performed prior to the nerve grafting. The upper extremity affords the most favorable field for nerve anastomosis. The efficiency of tendon and muscle grafting for restoration of muscle balance has been proved beyond question, and the foot is preeminently the region where it applies. Some success also has been obtained at the knee, but in the region of the hip the results have so far been slight. In the complex musculature of the hand the chances of benefit are much less. The attempt to secure greater stability in the paralyzed member, the production of an artificial ankylosis is sometimes advisable. Arthrodesis should, however, never be employed unless the damage is so great that a stiff joint will be a lesser evil. The operation is specially adapted to the ankle. In the knee the decision should be left to the patient, and in the hip it is often

of distinct value, since muscle and tendon transplantation does not offer much in this region. The shoulder, when the scapular muscles are unaffected, yields at times excellent results. The removal of the astragalus may sometimes be indicated, because it is a factor of instability at the ankle on account of its lack of muscular attachments. Tendon grafting and removal of skin flaps to overcome the tendency of the deformity are also mentioned. Silver says in conclusion that it is rare to find an untreated patient for whom some benefit cannot be obtained by orthopedic surgery. Fortunately, this treatment is most effective in the region most frequently affected, the foot, but in all regions enough can be gained to make the labor worth considering; usually the combination of several operations or procedures will be required.

SYPHILITIC ARTERITIS.

E. M. Hummel, New Orleans (*Journal A. M. A.*, September 17), says that only recently has sufficient emphasis been placed on the tendency of specific arteritis to appear shortly after primary infection, and on the relative frequency of isolated involvement of the arterial system as a lesion of syphilis. It is now held that this lesion in its pure form practically does not occur in very late syphilis, or more than three years after the initial lesion. The importance of recognition of these facts in the correct diagnosis and treatment of syphilis is sufficiently obvious. As a matter of course, it is essential to interpret correctly the symptoms of diminution of the blood supply, as shown in neurasthenia, transient paresis, etc., not extending to the gravity of organic disease. When actual hemorrhage, softening or thrombosis occurs, the symptoms are not specially different from those from other causes, excepting the tendency of syphilis to select the branches of the middle cerebral artery for its attacks. In Hummel's experience the involvement of the arteries supplying the striate body, thalamus and bulb are especially frequent. A detailed report of a case going on

to autopsy is given, showing these peculiarities very markedly.

EXPERIMENTAL POLIOMYELITIS IN MONKEYS

S. Flexner and F. A. Lewis, New York (*Journal A. M. A.*, August 20), contribute an eighth note on their experimental research on poliomyelitis in monkeys. It can now be accepted as an established fact, they state, that human beings and monkeys who have passed through an attack of poliomyelitis have come to contain in their blood certain neutralizing principles for the virus of the disease which are demonstrable by animal tests for two or more years in human beings and probably are equally persistent in monkeys. It has been shown, however, that monkeys after recovery from poliomyelitis are highly refractory to reinoculation with the disease, and it is probable that recovered human beings are similarly protected. A strong active immunity has been conferred. Recovery from the disease, however, is not the only way to obtain immunity, as it has been proved possible to make immune monkeys actively by infection into the subcutaneous tissue, either of a full strength virus or that which has been modified by chemicals like glycerin. This, however, is not uniformly safe, since some of the animals do not develop a strong immunity, but develop paralysis from the treatment. The test of this active immunity, as published, consisted in the power to resist a large intracerebral injection of the filtrate that in far smaller quantities produces paralysis in the control animal. It has been shown that the blood serum of human beings and monkeys recovered from the disease contains neutralizing principles for the virus lacking in normal serum, and it is safe to assume that these neutralizing substances are responsible for the immunity. Like substances, therefore, should be found in the serum of animals directly actively immunized which have not gone through an attack of poliomyelitis. When an active filtrate containing virus is mixed with the serum of actively immunized monkeys and inoculated for a