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Attempts at Chemotherapy in Experimental Poliomyelitis.*

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The experiments to be briefly presented deal with a systematic investigation into the merits of a number of pharmacological substances as possible chemotherapeutic agents in experimental poliomyelitis in the monkey. The list of substances studied includes the following chemotherapeutic compounds, disinfectants, and drugs: silversalvarsan, neosalvarsan, tryparsamide, colloidal bismuth, bismuth potassium tartrate, triphal (organic gold compound),† methylene blue silver, antimony potassium tartrate, neostibosan (organic antimony compound),† mercurochrome, metaphen, plasmochin,† Bayer 205 (Germanin),† chaulmoogra oil esther,† and hexylresorcinol solution. Since it soon became evident that restraining an already established infection was a hopeless task, we have for the most part administered the above mentioned substances during the incubation period by intravenous, intramuscular, or occasionally intraspinous injection of maximal doses, repeated as a rule at intervals of 2 or 3 days. The experiments were set up in small groups, comprising in each instance 4 or 5 treated animals and one, 2, or more untreated controls. The infection was produced by intracerebral inoculation with 1 cc. of the supernatant of a centrifuged 5% or 10% virus cord emulsion (Aycock strain). Although we have noticed at times slight fluctuations in virulence, as indicated by variation in the length of the incubation period and by the extent of the infectious process, this strain, during a period of 1 year, has never failed to bring down every normal control monkey after intracerebral infection with the above dosage. Needless to say, the authenticity of the lesions was verified in each case by histological examination of the cord. The remarkable uniformity of the infection may, in part, have been due to our careful selection of passage virus, which was obtained by pooling cord sections from different levels of at least three or four different poliomyelitic monkeys, killed at the height of the infectious process. The experimental data col-

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lected in the present study are based on observations bearing on 74 different monkeys, of which 42 were treated animals and 32 untreated controls.

As regards the prophylactic value of the various substances enumerated above, a certain antagonistic effect on the infection was observed particularly with the antimony compounds and the chaulmoogra oil esther, when administered repeatedly during the incubation period. Out of 11 antimony-treated monkeys 3 remained entirely free from symptoms, one showed an abortive form of the disease (transitory slight paresis of one arm only) and 2 developed much delayed paralysis, while in the remaining 5 animals the course of the acute infection, for all practical purposes, was fully as severe as in the accompanying controls. Of a total of 4 animals receiving chaulmoogra oil, 2 escaped the infection entirely, the other 2 developed partial paralysis. A certain prophylactic effect was noted after the administration of hexylresorcinol, particularly if the drug was given by the intraspinal route; of a total of 5 monkeys treated with this substance, one remained entirely free, one showed an abortive infection, while 3 succumbed to the disease. Neither antimony, nor hexylresorcinol solutions were viricidal *in vitro*. The next promising drug perhaps was mercurochrome, 2 monkeys after treatment developing only partial paralysis with very rapid convalescence and almost complete recovery. None of the other chemicals displayed the slightest effect whatsoever on the course of the infection. Reinoculation of those monkeys which had escaped the first infection presumably on account of the chemotherapeutic treatment demonstrated that these animals were fully susceptible.

In evaluating the above data, it should be borne in mind that the untreated infection in the controls ran not only a morbidity of 100% but also a very high mortality.

The small number of experimental animals precludes the drawing of any stringent conclusions, although the results obtained particularly with the antimony compounds and chaulmoogra oil may raise hopes for the possibility of influencing the disease favorably. The work is being continued with these two substances in an effort to obtain a more uniform chemotherapeutic effect.