in three instances. New bacterial preparations were made from each strain and the nitrogen contents were determined. The results of the second series showed but slight variation from the first. We are inclined to the view that either a relatively high or a low nitrogen content of certain strains may be an inherent quality, slightly deviating in this respect from the average strain, when grown under parallel conditions. Group III strains seemed to fall into two subgroups when based upon their nitrogen content; one (a) subgroup (four strains) showed an approximately lower percentage of nitrogen than the second (b) subgroup (six strains), which showed a nitrogen content similar to the three other serological groups. A number of possible factors which might cause this variation have been considered, but as yet, no one has proved to be the direct cause. Averages of the results taken from ten strains analyzed in each of the serological groups gave the following total nitrogen content:

Group I, 9.4 per cent.; Group II, 10 per cent.; Group III, 8 per cent. (subgroup "A" gave 7.43 per cent.; subgroup "B" gave 9.3 per cent.); Group IV, 8.8 per cent. As is apparent, the total nitrogen content of the four general serological groups does not greatly deviate from a mean average of 9 per cent., a mean which is reduced by using a general average of 8 per cent. for Group III. It must be emphasized that these values are not considered fixed, since a parallel series might slightly alter the percentage results.

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The transmission of the virus of herpes febrilis along sensory nerves with resulting unilateral lesions in the central nervous system in the rabbit.

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Rabbits inoculated upon the cornea of the right eye with our virus of *Herpes febrilis* show constantly on about the fourth or fifth day a turning of the head toward the right side; during the succeeding days the neck is twisted strongly toward the

right and held rigidly in that position. This picture was described by Doerr and Schnabel and later by Levaditi and was attributed by Doerr and Schnabel to an encephalitis, the virus probably passing from the cornea to the brain by way of the blood stream. Levaditi, on the other hand, claimed to have proved that the virus passed from the cornea along the optic nerve to the brain. Our observations make it evident to us that this symptom is due to a lesion on the right side of the pons and medulla along the distribution of sensory fibers of the fifth cranial nerve, which involves the roots of the spinal accessory nerve supplying muscles of the neck on the same side, and that this lesion is produced by the virus of herpes entering the brain from the cornea by way of the sensory portion of the fifth cranial nerve. No other lesion has been observed in the brain which might be attributed to passage of virus from the eye along any other nerve, and the unilateral situation of the lesion precludes its production by transmission of the virus through the blood stream. At autopsy on a rabbit inoculated into the right eye killed after the appearance of a turning of the head to the right, one frequently finds macroscopic hemorrhages situated at the point of entrance of the fifth cranial nerve and along the side of the pons and medulla corresponding approximately to the distribution of sensory fibers and nucleus of this nerve on the right. Microscopically an acute inflammation is found with degeneration, necrosis and infiltration with polynuclear and mononuclear cells limited to the right side of pons and medulla corresponding to the gross lesions, sometimes descending superficially on the same side along the dorso-lateral portion of the cord involving the root of the first cervical nerve. This lesion has not been observed to extend upward from the entrance of the fifth cranial nerve.

In such a lesion, cells of glial and ganglion types are found to contain intra-nuclear inclusion-bodies similar to those described by Lipschütz in the cornea of rabbits inoculated with virus of herpes febrilis, and which we regard as pathognomonic of herpetic lesions in general.

The following additional experiments may be cited as confirming the passage of this virus along sensory nerves:

(1). A rabbit inoculated into the skin of the right hind leg developed on the 10th day impairment in the use of this leg, progressing during the next few days to practically complete

disability of this extremity. On the 11th day impairment in function of the left leg followed. At autopsy the lumbar region of the cord showed gross hemorrhages limited to the right dorsal surface of the lumbar portion of the cord along the line of entrance of dorsal root fibers. Microscopic sections showed lesions like those found in the pons and medulla including the presence of intra-nuclear inclusion-bodies, involving the right dorsal and a portion of the lateral area of the cord, with an extension along the posterior commissural fibers to the median portion of the left dorsal cord.

Following inoculation of the skin with virus of herpes, Levaditi noted paralysis of the posterior extremities in a rabbit but clearly states that no lesions were found in the cord.

(2.) A rabbit inoculated into the peritoneum of the abdominal wall to the left of the median line developed on the 15th day a lateral curvature of the spine with convexity toward the left side. Microscopic sections of the dorsal cord showed a degeneration of sensory fibers situated dorsally and median to the entrance of dorsal root fibers limited to the left side.

(3.) A rabbit inoculated into the left adrenal developed on the fifth day impairment in function of both hind legs with apparent paralysis of abdominal muscles.

Sections at different levels of the cord showed in the lower dorsal region, acute lesions, as described in pons and medulla, involving the left side along the entrance of sensory root fibers.

In this case we assume the virus passed along the sympathetic fibers from the adrenal, entering the cord through the dorsal root.