TABLE I.
Failure to Produce Neuronal Changes in Rabbits by Means of Intracranial Inoculation of MV Virus During Insulin Hypoglycemia.

Rabbit No.	Blood sugar, mg%	Signs of hypoglycemia	Cause of death	Survival period
19*	60	+	Hypoglycemia	18 hr
38†	49	+	"	20 "
33†	60	+	"	48 "
42†	61	+	Sacrificed	72 "
25*	64	0	"	9 days
17*	63	0	"	9 "
62†	62	0	"	30 "

*Mixed breed.
†New Zealand white breed, males.

hypoglycemia (Table I). No neurological signs of anterior horn damage appeared, and histological studies of the brain and spinal cord revealed no neuronal injury or other evidence of CNS lesions.†

Summary. The intracranial inoculation of rabbits with the MV strain of poliomyelitis virus during insulin hypoglycemia did not produce neurological or pathological signs of anterior horn damage. These findings lend no confirmation to the theory of Sandler that hypoglycemia decreases the cellular oxidation of the central nervous system tissues, thus lowering their susceptibility to neuronal damage by the poliomyelitis virus.

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Isolation of Virus from Feces of Mice Receiving Intranasal Inoculations of Epidemic Influenza Virus.

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Epidemic influenza virus has been recovered from the lungs of experimental animals injected intraperitoneally with large amounts of virus.[1] No account of the recovery of the virus from feces has been found in the literature. Accordingly, experiments were outlined to detect the presence of the PR8 strain of influenza virus in the feces of infected animals. At the outset it was essential to develop a method for the treatment of the feces which would destroy

† We are indebted to Dr. Konstantin Scharenberg for the histological examination of these tissues.

1 Rickard, E. R., and Francis, T., Jr., *J. Exp. Med.*, 1938, **67**, 953.

the microbic flora without injury to the virus if present. The recent work in which diethyl ether was used under similar conditions with the virus of poliomyelitis suggested investigating this reagent.[2] In a number of experiments of which the following is an example the resistance of the virus to this chemical was clearly demonstrated.

Experiment I. A 5% suspension of infected lung tissue was prepared with infusion broth of pH 7.2. This was centrifugated at 1600 rpm for 10 minutes. The supernatant fluid was passed through sterile Berkefeld N filters at a negative pressure of 50 cm of mercury.

A portion of the filtrate was treated with 10% diethyl ether and kept at 5°C for 90 hours. The ether was then removed by distillation *in vacuo* at 18°C. White mice, 4 to 6 weeks old, which had been sufficiently anesthetized to stop the scratching reflex were inoculated intranasally with 0.05 cc of the ether-treated material.

The animals died in 4 to 6 days after inoculation. At autopsy, their lungs exhibited the same degree of consolidation as the lungs of control animals inoculated with the untreated virus.

Experiment II. On the basis of the forementioned results the experiments were extended in the following manner. Again only typical examples will be given.

A group of 3 mice was inoculated intranasally with 0.05 cc of a 5% virus filtrate. Three days after the inoculation the animals were placed in a clean, sterile cage. Fecal specimens, collected immediately upon defecation, were placed in physiological salt solution and thoroughly emulsified. Enough ether was added to make a 10% mixture which was kept at 5°C for 36 hours. The ether was then removed by distillation *in vacuo* and the residue instilled into the nostrils of 2 mice. Five days later the mice were sacrificed and at autopsy the lungs showed consolidation similar to that caused by influenza virus.

It was essential to establish that the condition in the mice was due to the PR8 strain of virus with which the mice had been infected intranasally. As a consequence, 5 serial passages of the recovered virus were accomplished in mice; the last 2 transfers were by means of 5% filtrates prepared in the usual manner. The animals died within 3 to 6 days after inoculation and at autopsy their lungs were consolidated as in mice dead of influenza. In order to determine the identity of the recovered virus, neutralization tests were employed with 2 samples of PR8 immune ferret sera. These antisera, one

[2] Trask, J. D., Vignec, A. J., and Paul, J. R., PROC. SOC. EXP. BIOL. AND MED., 1938, **38**, 147.

specific, the other polyvalent, were secured through the courtesy of Dr. Frank L. Horsfall of the Rockefeller Institute. One cc of each antiserum was diluted 1:5 with physiological salt solution.

The following neutralization tests were carried out:

1. *Controls.* (a) Five percent virus filtrate PR8 strain, with specific antiviral serum in a final dilution of 1:10. (b) Five percent virus filtrate, PR8 strain, with polyvalent antiviral serum in a final dilution of 1:10.

2. *Experimental.* (a) Five percent virus filtrate, mouse feces origin, with specific antiviral serum in a final dilution of 1:10. (b) Five percent virus filtrate, mouse feces origin, with polyvalent antiviral serum in a final dilution of 1:10.

The above mixtures were incubated at 37°C for one-half hour; controls to detect any influence of temperature on the 2 virus filtrates were included. Six groups of mice, 3 in each, were inoculated with the 2 filtrates and 0.05 cc of the neutralized mixtures. Aerobic and anaerobic tests for ordinary bacterial contamination were made of the 2 filtrates. No visible growth was evident in any of the filtrates at the end of 4 days.

The groups of mice inoculated with the filtrates died within 3½ to 5 days; in every instance the lungs were completely consolidated. The animals inoculated with the 4 neutralized mixtures were active and healthy 24 hours after inoculation and continued in this state for 6 days, when they were sacrificed and autopsied. No consolidation of the lungs was evident; 2 of the lungs showed slight congestion; 8, medium congestion; and 2 extensive congestion.

Neutralization tests of the influenza virus and the virus filtrates of mice feces origin were not run with normal ferret serum for the reason that it was not available. However, Smith, Andrewes and Laidlaw[3] state in their publications that normal ferret serum does not neutralize influenza virus.

Summary and Comment. 1. The human influenza virus, PR8 strain, is resistant to treatment with 10% ether for at least 90 hours. 2. Influenza virus was present in the feces of mice 3 days after the intranasal inoculation of the virus. This was identified by neutralization tests. 3. In reporting these studies the source of the virus found in the feces has not been considered. There are several possibilities, the most important of which are: (a) The swallowing and survival of part of the material introduced into the nose at the time of the original inoculation. (b) Following multiplication of

[3] Smith, W., Andrewes, C. H., and Laidlaw, P. P., *Lancet*, 1934, **2**, 66.

the virus in the lungs of the animals infected sputa was swallowed. In addition the multiplication of the virus in the digestive tract has been postulated and is being investigated. 4. No attempts have been made to isolate the virus from the feces of human patients with typical epidemic influenza.

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Chemical Composition of Fluids from Benign Cysts of the Antrum.

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The maxillary sinus may be the site of several types of benign cysts; this report deals only with the non-secreting type. These cysts form in the connective tissue of the antrum mucosa and are lined by loose connective tissue which contains many capillaries, along with numbers of leucocytes and reticulo-endothelial cells. These cysts vary considerably in size and require a period of weeks or months to develop to the point where they fill the antrum. They contain a clear fluid which coagulates rapidly after removal and has a yellow or amber tinge.

Little is known about the formation of these cysts or why they produce such definite symptoms in a patient. It was thought, therefore, that chemical analyses of the fluid obtained from these cysts might contribute some useful knowledge.

Experimental. The presence of the non-secreting cyst was determined by X-ray films of the sinus, which showed a large, rounded, soft-tissue mass lying in the maxillary sinus. To obtain the fluid from the cyst and to reach the anterior part of the sinus the antrum is punctured with a curved trocar and cannula. Because the cyst may lie anteriorly, the method of puncture must permit exploration of the anterior and inferior region of the sinus as well as posteriorly. The cyst may regress after puncture and lavage. Recurrent or large cysts require surgical removal.

The volume of fluid obtained varied from 2 to 10 cc, depending upon the size of the cyst and the efficiency of the puncture. The specimens were always clear with a yellow tinge and always clotted. The fibrin was removed by twirling on a glass rod and the clear