13051

Virus of Spontaneous Encephalomyelitis Found in Intestines of Normal Wild Gray Mice.

PETER K. OLITSKY AND R. WALTER SCHLESINGER.

From the Laboratories of the Rockefeller Institute for Medical Research, New York City.

Practically all of more than 300 normal, adult, albino mice (Rockefeller Institute, Swiss, and other strains) thus far tested, harbored in their intestines the virus of spontaneous encephalomyelitis (Theiler's disease; "mouse poliomyelitis").[1, 2] The experimental and the spontaneous forms of this disease have been shown to be closely similar to human and experimental (monkey) poliomyelitis; moreover, there is a resemblance in many properties of the viruses causing the respective maladies.[1, 2] A recent study[3] of albino mice revealed no essential difference between the lesions of experimental and spontaneous Theiler's disease and those[4] of the experimental infection induced by the Lansing strain[5] of human poliomyelitis.

Albino mice have occurred among gray mice under domestication and have then been inbred. They are used chiefly as stock animals in biological laboratories, while the animal from which they are derived, the wild gray mouse, is not only a commensal of man but in its predatory existence it can contaminate man's food with its excreta. The almost universal presence of a virus, having so much in common with that of human poliomyelitis, in the intestines and feces[1, 2] of the albino mice, is therefore of less significance to an epidemiologist than would be the finding of Theiler's virus in the intestines of wild gray mice. Hence, a search was undertaken for Theiler's virus in the intestines of apparently normal, wild gray house-mice, and those most readily at hand were the ones trapped in one of the animal houses of the Rockefeller Institute.

At the outset it should be noted that these gray mice are as susceptible to Theiler's virus, given intracerebrally, as are their albino

1 Olitsky, P. K., PROC. SOC. EXP. BIOL. AND MED., 1939, **41**, 434; *J. Exp. Med.*, 1940, **72**, 113.

2 Theiler, M., and Gard, S., *J. Exp. Med.*, 1940, **72**, 79.

3 Olitsky, P. K., and Schlesinger, R. W., PROC. SOC. EXP. BIOL. AND MED., 1941, **47**, 79.

4 Lillie, R. D., and Armstrong, C., *Pub. Health Rep.*, 1940, **55**, 718.

5 Armstrong, C., *Pub. Health Rep.*, 1939, **54**, 1719.

TABLE I.
Theiler's Virus in Intestines of Adult Wild Gray Mice.

Exp. No.	No. of mice used	Pooled materials used	Paralysis produced	Remarks
1	3	12% suspension entire intestinal tract	0/8*	
		10% susp. of brain	0/8	
2	2	10% susp. of contents only of entire intestinal tract	7/8	Brain to brain 2nd passage with 10^{-1} to 10^{-6} suspensions, 84/95. Similarly, 3rd passage with 10^{-1} suspension, 10/10.
		10% susp. of brain	0/7	
3	3	10% intest. contents	7/10	
		10% susp. of brain	0/10	
4	5	10% intest. contents	4/14	
		10% susp. of brain	0/6	
5	5	10% intest. contents	1/14	
		10% susp. of brain	0/6	
6	4	10% intest. contents	2/14	
		10% susp. of brain	0/6	

*The numerator represents the number showing paralysis and the denominator the number of albino mice injected.

derivatives. The encephalomyelitis so induced in both strains is indistinguishable on clinical, pathological, and immunological grounds; furthermore, the experimental disease in gray mice is transmissible and can be repassaged to albino mice.

The methods used have already been described.[1] Table I shows the results obtained in 6 experiments in each of which the intestinal material and, in parallel, the brains of from 2 to 5 gray mice were pooled.

The outcome of 5 of the 6 experiments clearly points to the presence of the encephalomyelitic virus in the intestines of the apparently normal, gray mice trapped at the Institute. Further studies revealed that the intestinal virus deriving from the gray mice is not different from that obtained from albino strains in clinical, pathological, and immunological (cross-immunity) properties and also in its non-pathogenicity in *rhesus* monkeys.[6] As in albino mice, no virus was detected in the brains of the normal gray mice; in the former, virus was found in the brain only when they exhibited clinically apparent Theiler's disease.[1, 2]

Discussion. Based on lesser proportion of positive results of pools, it would appear that not as many apparently normal gray

[6] Olitsky, P. K., PROC. SOC. EXP. BIOL. AND MED., 1940, **45**, 339.

mice harbor Theiler's virus in their intestines as do albino ones.[1, 2] (*Cf.* Theiler[7].)

Although rigid quarantine and isolation are practiced in the animal house, no such control can be applied to predatory, wild gray mice. Hence the possibility arises that they were contaminated with Theiler's virus in an endemic focus populated by virus-carrying albino mice. This has not as yet been proved a fact; meanwhile, 5 experiments in which were examined 7 house and 3 field gray mice, all trapped at a distance from the laboratory, failed to show virus in their intestines or brains. Dr. Max Theiler reports, in addition, that virus was not detected in a much larger series of gray mice trapped away from the Institute.[7]

Conclusions. (1) Wild gray house-mice are as susceptible to intracerebral introduction of Theiler's virus as are albino mice. (2) Apparently normal gray mice trapped in an animal house in which almost all adult albino mice are carriers of Theiler's virus, reveal this virus in their intestines and not in their brains. (3) The virus is indistinguishable from that obtained from the intestines of normal albino mice. (4) The number of gray mice shown to be carriers of Theiler's virus, while considerable, appears to be lower than that of carriers found among the albino strain.

Preliminary tests to the present time have failed to indicate that the virus is demonstrable in gray house and field mice trapped at a distance from the laboratory. This subject is still under investigation.

13052

Correlation of Histological Differentiation with Beginning of Function of Developing Thyroid Gland of Frog.

AUBREY GORBMAN AND HERBERT M. EVANS.

From the Institute of Experimental Biology, University of California, Berkeley, California.

The capacities for removal of inorganic iodine from the blood stream and for storage of such iodine in organic form in relatively high concentration are well known properties of the adult thyroid gland. The recent use of "tagged" radioactive iodine has provided the tool for the striking, graphic demonstration of these properties

[7] Theiler, M., Studies on Poliomyelitis, De Lamar Lecture, in press.