the inhibiting compound. This is in agreement with the observations of Velardo and Hisaw(18) on the inhibition of decidual development by 4-amino PGA in rats. The present state of our knowledge of the action of aminopterin indicates that it interferes in some way with the enzyme systems associated with the physiological activity of estrogen and progesterone(19-25).

Summary. The response of the uteri of ovariectomized mice to a total amount of 0.0054 μg progesterone was inhibited by the simultaneous administration of 0.0240 to 0.030 μg 4-amino pteroylglutamic acid. Aminopterin (4-amino PGA) showed no selective inhibition for estrogen or progesterone when combined with these two steroids, but inhibited both of these compounds when injected within a ligated segment of the uterus of ovariectomized mice according to the method of Hooker and Forbes.

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Rabies Street Virus Strains in the Syrian Hamster and in the Swiss Albino Mouse. (19975)

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Specific inclusion bodies present in the central nervous systems of animals dying from rabies are called "Negri bodies"(1,2). These are most frequently demonstrated within, but are revealed occasionally outside the nerve cells. A definite diagnosis of rabies is made upon demonstration of these bodies in stained smears. These inclusions are eosinophilic bodies, usually spherical, but of other shapes, varying from 1 to 30 μ in size. The inner structure shows basophilic granules. At present the animal most frequently used for the diagnosis of rabies is the mouse. A positive diagnosis is made on the development of symptoms of rabies in the mouse and the presence of Negri bodies in the mouse brain.

However, the Negri bodies are frequently small and few in number, which sometimes makes their detection difficult. In previous studies the authors found the Negri bodies present in the brains of rabies-infected hamsters to be large and quite numerous.

The present study was undertaken to compare the mouse and hamster as test animals for the diagnosis of rabies.

Materials and methods. The strains of rabies virus used in this study were obtained from Dr. A. N. Metcalf of the Pennsylvania Bureau of Animal Industry at Enola, Pennsylvania. These strains are as follows: 191247 (fox brain), 191248 (dog brain), 191268 (fox brain), 191324 (fox brain), 191427 (cow brain), 191492 (fox brain), 191511 (cat brain), 191512 (fox brain), 191761 (cat brain), 191800 (fox brain), 192482 (dog brain), 192486 (dog brain), 192510 (dog brain), and 192743 (dog brain). These specimens had been proven positive for rabies at the Pennsylvania Bureau of Animal Industry, and were preserved in glycerin until initiation of the present study. The specimens were removed from the glycerin, ground in mortars with alundum, and diluted to 20% suspensions with physiological saline. Each suspension was cultured in thioglycollate broth, and all, except for 191247, were found to be contaminated with bacteria. Since mice are relatively resistant to small numbers of bacteria inoculated intracerebrally, no attempt was made at this time to eliminate the bacterial contaminants. Diagnosis of rabies in hamsters and mice was made on the following factors: 1) virus symptoms present in hamsters and mice and 2) demonstration of Negri bodies in the Ammon's horn of the hamster and mouse brain. The presence of Negri bodies was determined by staining touch preparations of the Ammon's horn with Sellers' stain (3) and examining the slides under an optical microscope. Fifty-six healthy Syrian hamsters, age 18 days, were divided into 14 groups of 4 hamsters each. Each group was inoculated intracerebrally with one of the rabies-bearing brain suspensions. Each hamster received 0.03 cc. Fifty-six additional hamsters were divided into 14 groups, and each group was administered one of the above suspensions by rectal instillation. Each hamster received 0.1 cc. For the rectal instillation, the end of an 18-gauge needle was filed off, rough ends smoothed down, and the tip lubricated with vaseline before being inserted. Fifty-six Swiss albino mice, age 3 weeks, were divided into 14 groups of 4 mice each. Each group was inoculated intracerebrally with one of the suspensions. The inoculum for each mouse was 0.03 cc.

Results. All hamsters and mice inoculated intracerebrally with specimen 192743 succumbed to bacterial infection. The specimen was treated with ether in an attempt to eliminate the contaminating organisms. However, on reculture, there was still gross contamination, and hamsters and mice inoculated intracerebrally with the ether-treated suspension succumbed within 24 hours. The hamsters which had received the rabies suspensions by rectal instillation remained normal until the 5th to 10th day post challenge, at which time symptoms of rabies were evidenced.

All 56 hamsters injected intracerebrally with the rabies suspensions showed symptoms of rabies between the 6th and 9th days. The incubation periods and the form of rabies (furious or dumb) for each strain are given in Tables I and II. The animals were sacrificed when symptoms of rabies appeared. By using the Sellers' stain technic numerous Negri bodies were found to be present in the brains

TABLE I. Response of Hamsters Inoculated Intracerebrally with Rabies Street Virus. Four hamsters injected in each series. Numerous Negri bodies in each series.

Virus strain	Min to max incubation period, days	Type of rabies	
		Dumb	Furious
191247	7		Yes
1248	7		"
1268	8–9	Yes	
1324	9	"	
1427	8	"	
1492	8	"	
1511	7		"
1512	6		"
1761	8–9	"	
1800	6		"
2482	8	"	
2486	6	"	
2510	8	"	
2743	C*		

* C = Contaminated.

TABLE II. Response of Hamsters to Rabies Street Virus Administered Rectally. Four hamsters exposed in each series. Negri bodies numerous in each series.

Virus strain	Min to max incubation period, days	Type of rabies	
		Dumb	Furious
191247	10	Yes	
1248	5–7		Yes
1268	8	"	
1324	10	"	
1427	9	"	
1492	9	"	
1511	10	"	
1512	10	"	"
1761	10	"	
1800	10	"	
2482	10	"	
2486	10	"	
2510	10	"	
2743	9	"	

TABLE III. Response of Mice to Rabies Street Virus. Four mice exposed in each series. Few Negri bodies in each series.

Virus strain	Min to max incubation period, days	Type of rabies	
		Dumb	Furious
191247			
1248			
1268			
1324			
1427			
1492			
1511	8	Yes	
1512			
1761			
1800			
2482			
2486			
2510			
2743	C*		

* C = Contaminated.

of the infected animals. The mice injected intracerebrally with the rabies strains, showed symptoms of rabies on the 8th day and were examined, utilizing the same method as mentioned above. The results are given in Table III.

Discussion. As noted in Tables I through III, the incubation periods varied somewhat, depending upon the species of animal inoculated and the route of inoculation. With 6 strains the incubation periods were one to 2 days shorter in the intracerebrally inoculated hamsters than in the mice. However, with 3 strains the incubation periods were one day longer in the hamsters than in the mice. With all but 2 strains, the incubation periods in hamsters of the rectal group were one to 2 days longer than in the mice.

Upon examination of the touch preparations, Negri bodies seen in the hamster brains were more numerous and larger than those in the mouse brains.

The advantage of rectal over intracerebral administration of the virus is demonstrated with strain 192743. In this instance, the specimen was so grossly contaminated that all hamsters and mice inoculated intracerebrally, succumbed to bacterial infection within the first 24 hours, whereas those hamsters challenged rectally were unaffected by the contaminants.

Summary. 1. Hamsters and mice were challenged intracerebrally and hamsters rectally with 14 strains of rabies street virus in order to determine the better species of animal and route of inoculation in diagnostic work for rabies. With 6 of the 14 strains the incubation periods in intracerebrally inoculated hamsters were shorter than in the mice. Although the incubation period was longer in the hamsters challenged rectally, no preliminary treatment to eliminate bacterial contamination was necessary. 2. Examination of stained touch preparations revealed that the Negri bodies in infected hamster brains were larger and more numerous than those in infected mouse brains.

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