the major part of the liver tissue by the cysts. It is interesting that the same organism that often leads to the formation of liver sarcomas in older animals is also associated with the adenomatous gastric lesion which has been described.

Further studies are now in progress on the effect of dietary modifications on the development and possible prevention of the lesion.

Summary. The production of adenomatous stomach lesions of the rat, associated with heavy liver infestations of *Cysticercus fasciolaris,* is reported. The adenomatous stomach lesions have been produced in 3 different strains of rats.

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A Virus Pneumonia of Syrian Hamsters.*

H. E. PEARSON AND M. D. EATON.

From the Research Laboratory of the California State Department of Public Health, Berkeley, California.

In the course of attempts to infect Syrian hamsters (*Cricetus auratus*) 2 to 4 months old, with influenza A, virus strain W. S.,[1] another filterable agent capable of producing a fatal pneumonia in these animals was found. One hamster was inoculated intranasally with mouse-passage influenzal virus (W.S.) and developed slight nasal symptoms. This animal was sacrificed after 8 days and suspensions of lung and turbinate were passed to a second hamster which had large plum-colored pneumonic areas in its lungs when killed at 6 days. Subsequently suspensions of lung and turbinate have been carried through 17 serial intranasal passages in hamsters with the production of pneumonia in each passage except the first and third. The suspensions at each hamster-passage when inoculated intranasally into mice produced a pneumonia which was usually fatal within 6 to 9 days. Attempts to produce a similar pneumonia in hamsters with several other mouse-passage strains of influenzal virus were unsuccessful. We were also unable to repeat the original experiment starting with another mouse-passage of the strain W.S.

* The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of The Rockefeller Foundation and in coöperation with the California State Department of Public Health.

1 Taylor, R. M., PROC. SOC. EXP. BIOL. AND MED., 1940, **43**, 541.

Cultures of lung and turbinate-suspensions on the ordinary bacteriological media gave either no growth or only a few colonies of various kinds of bacteria. A Berkefeld V filtrate of a suspension was infectious for hamsters, but not for mice. The agent failed to pass a Seitz filter.

Signs of infection in the hamster were variable, but usually 2 to 6 days following nasal inoculation the animal sniffed or sneezed and rubbed its nose. Then rhonchi, ruffled fur, dyspnea, and weakness were noted. Death occurred in 6 to 15 days, sometimes preceded by a terminal bloody nasal discharge. The only change in temperature was a terminal fall.

The lungs of dead animals were moist, plum-colored and completely consolidated. The turbinates were swollen and red. Other organs did not appear abnormal. The lungs of animals killed showed lesser degrees of lung-involvement. Some animals died without lung-lesions after having signs of infection. Microscopically there were hyperemia, infiltration and thickening of the alveolar walls with serous and slight cellular exudate in the alveoli. Mononuclear cells predominated. There were extensive areas of partial or complete atelectasis. The bronchi showed little or no abnormality, but evidence of damage was present in the nasal mucosa. No gross or microscopical changes were seen in the brain, heart, liver, spleen, or kidney.

Lung or nasal mucosa was infectious for hamsters and for mice, but no virus was recovered from other organs. Parallel titrations of hamster-material in mice and hamsters indicated that the latter probably were more susceptible.

Subcutaneous, intra-abdominal, or intracerebral inoculation did not result in any sign of infection except, occasionally, sniffing and ruffled fur. Normal hamsters placed in contact, for periods of 1 to 5 days, with animals infected by intranasal inoculation sometimes developed signs of infection and, occasionally, small lung-lesions. Hamsters inoculated subcutaneously, intra-abdominally, and intracerebrally, and also hamsters infected by contact were resistant 3 to 5 weeks later to an intranasal dose of virus that was regularly fatal to control animals. Some of the immune animals had nasal symptoms after reinoculation.

While testing throat-washings by serial intranasal passage of lung-suspensions in mice, we have isolated 3 apparently identical strains of a virus which corresponds in its properties with the mouse-pneumonia virus described by Horsfall and Hahn.[2, 3] Pneumonia-

[2] Horsfall, F. L., Jr., and Hahn, R. G., PROC. SOC. EXP. BIOL. AND MED., 1939, **40**, 684.

[3] *Ibid., J. Exp. Med.*, 1940, **71**, 391.

viruses have been isolated from the lungs of normal mice by other workers.[4, 5]

Cross-immunity and neutralization-tests in hamsters and mice indicated that the virus isolated in hamsters was antigenically related to our strain of mouse-pneumonia virus, but was different from influenzal virus. Direct inoculation of mouse-pneumonia virus into hamsters gave the same fatal pneumonia as that following hamster-virus injection. However, the second and third passages in hamsters with the mouse-passage virus gave irregular results.

These agents appear to differ from the pleuropneumonia-like organism described by Edward[6] in that they produce a more rapidly fatal pneumonia of a different type. However, the possibility that a pleuropneumonia-like organism is concerned in the production of hamster-pneumonia cannot be excluded at present.

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Electrophoresis of Influenzal A-Virus.

JAQUES BOURDILLON. (Introduced by J. H. Bauer.)

From the Laboratories of the International Health Division, The Rockefeller Foundation, New York.

In a recent publication[1] a study was made of the electrical mobility of the complement-fixing antigen present in mouse-lungs infected with influenzal A-virus.[2] This paper reports a study of the mobility of the virus itself made under the same experimental conditions.

Material and Methods. The material used was a 10% suspension of mouse-lung infected with the PR8 strain, which was dialyzed against various buffers (Table I). It was placed in the medium size cell of the Tiselius apparatus, and the current was allowed to pass for 2 to 3 hours under a potential gradient of about 10 V/cm. It was then sampled at various levels in the cell, and each sample was titrated in mice. Details of the sampling procedure have been given else-

4 Dochez, A. R., Mills, K. C., and Milliken, B., PROC. SOC. EXP. BIOL. AND MED., 1937, **36**, 683.

5 Gordon, F. B., Freeman, G., and Clampit, J. M., PROC. SOC. EXP. BIOL. AND MED., 1939, **39**, 450.

6 Edward, Derrick G. F., *J. Path. and Bact.*, 1940, **50**, 409.

1 Bourdillon, J., and Lennette, E. H., *J. Exp. Med.*, 1940, **72**, 11.

2 Horsfall, F. L., Jr., Lennette, E. H., Rickard, E. R., Andrewes, C. H., Smith, W., and Stuart-Harris, C. H., *Lancet*, 1940, in press.