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.

11794

Electrophoresis of Influenzal A-Virus.

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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.

TABLE I.
Approximate Electrophoretic Mobility of Influenzal A Virus.

Buffer	(Mobility $cm^2\ v^{-1}\ sec^{-1} \times 10^5$) Ascending	Descending
Phosphate pH 6.8, ionic strength 0.1	—6.5	—4.5
" " 7.9 " " 0.1	—5.5	....
Borate " 9.8 " " 0.04	—8.0	—8.0

TABLE II.
Electrophoresis of Influenza A Virus in Borate Buffer, pH 9.8, Ionic Strength 0.04. Potential Gradient 11.2 V/cm. Time 112 Minutes.

Sample No.	Mean distance of sample from initial ascending boundary (cm)	Virus titer (log)	Antigen titer*
1	14.0	1.0	0
2	11.7	2.3	0
3	9.4	2.7	0
4	7.1	3.7	1:4
5	4.8	5.0+	1:32+
6	2.0	5.0+	1:32+
7	—0.9	5.5+	1:32+
8	—3.2	5.0+	1:32+
9	—5.5	5.5+	1:32+
10	—7.8	4.7	1:16

The compensation which was applied during electrophoresis caused a displacement of the theoretical position of the initial ascending boundary from the middle of the ascending side to the bottom of the descending side.
*Determinations kindly performed by Dr. E. H. Lennette.

where.[1] The virus-titration method used has been described by Horsfall.[3]

Results. Table II gives a simplified account of one experiment. Sample 1 was removed from the bottom of the top section of the cell; samples 2 to 5 from the 2 middle sections on the ascending side; sample 6 from the bottom section; samples 7 to 10 from the 2 middle sections on the descending side. The viral titer was 5.3 log in the original material; it remained about the same in samples 5 to 9. Between samples 5 and 4 there was a drop in titer of at least 1.3 log, or twentyfold; it was paralleled by a drop in antigenic titer of from (probably) 1:64 to 1:4; a further tenfold drop in viral concentration occurred between samples 4 and 3, paralleled by a drop to 0 in antigenic titer; in samples 1 and 2 the viral concentration was only 1/1000 or less that of the original material. Assuming the boundary to be between samples 4 and 5, calculation gave -8×10^{-5} as the most probable value for the mobility of both virus and antigen in this experiment. Similar experiments were made at other pH's, the results of which have been summarized in Table I. In the same

[3] Horsfall, F. L., Jr., *J. Exp. Med.*, 1939, **70**, 209.

buffers, the mobility previously obtained for the complement-fixing antigen was respectively 5.2, 5.4, and 7.8×10^{-5}.[1]

It appears, therefore, that the mobility of the virus and that of the antigen at alkaline pH are, if not identical, at least of the same order of magnitude. Below pH 5.6 the virus was rapidly destroyed so that its mobility could not be investigated in the acid range. The experiments did not suggest that the boundaries were less sharp than those of any protein-fraction studied optically, nor that any considerable endosmotic streaming had taken place, such as was observed by McFarlane[4] with vaccinial virus. It is probable that the absence of important convective currents was due to the concentration-gradient created by the other proteins present in the suspension.

Summary. The electrophoretic mobility of influenzal A-virus has been found to be about -5.5×10^{-5} cm^2 V^{-1} sec^{-1} at pH 7 to 9, ionic strength 0.1; and about -8×10^{-5} at pH 10, ionic strength 0.04. It appears to be the same as that of the complement-fixing antigen.

11795 P

Early Localization of the Thyroid Anlage in *Hyla regilla.*

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Since the initial work of Vogt[1] on the localization of anlagen in the young amphibian gastrula, investigators have continued to map out on the anuran or urodele gastrula the presumptive areas which in normal development give rise to particular organs or structures. Although Holtfreter[2] has added considerably to the knowledge of these areas by explantation, the major number of the studies have utilized the technique of vital staining.

In a 3mm. tail-bud embryo of the Pacific tree frog, *Hyla regilla,* the thyroid is visible as a ventral outgrowth just anterior to the yolk mass which forms the floor of the archenteron. Röhlich[3] has shown that for *Triton* at least, the major part of the foregut arises from the dorsal lip of the blastopore. The location of the thyroid in the older embryo, however, gives no indication whether its origin is from the dorsal or the ventral lip.

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4 McFarlane, A. S., *Tr. Faraday Soc.*, 1940, **36**, 257.

1 Vogt, W., *Arch. f. Entw-mech.*, 1925, **106**, 542.

2 Holtfreter, J., *Arch. f. Entw-mech.*, 1938, **138**, 522.

3 Röhlich, K., *Arch. f. Entw-mech.*, 1933, **129**, 794.