(to remove trichloracetic acid and the majority of adsorbed lipids). The protein thus isolated weighed 15.7 g following drying at 110°. Hydrolysis and isolation of glutamic acid hydrochloride again were carried out by the procedures used by Kögl, Erxleben, and Akkerman.[6]

Summary. Proteins obtained from the embryonic tissues of chicks and pigs have been hydrolyzed, and the glutamic acid hydrochloride obtained from the hydrolysates examined in the polarimeter. The glutamic acid hydrochloride isolated was entirely the 1(+) variety.

11332 P

Effect of Trypsin on Development of *Rana pipiens.*

ALFRED F. BLISS. (Introduced by L. G. Barth.)
From the Department of Zoology, Columbia University.

Proteases secreted by the embryos of numerous species of fish and amphibia are believed to be important factors in bringing about hatching by digestion of the egg membranes. It has been asserted that in teleosts this protease is much like trypsin and so powerful that it attacks the embryo itself.[1] This statement conflicts with the dictum that living organisms are resistant to digestive enzymes. A striking confirmation of the latter view is Northrup's demonstration of the immunity of a wide variety of organisms to concentrated trypsin.[2]

These conflicting statements suggested the desirability of investigating the action of trypsin on the embryologically useful amphibian *Rana pipiens.* Since this anuran appears to possess a hatching enzyme the effect of trypsin on both membranes and embryonic viability was studied. The eggs were stripped of excess jelly on paper toweling and immersed in a 10% solution of dialyzed trypsin made up in 10% Ringer solution. Each experiment involved 25-50 eggs. Table I gives some typical results.

These results are in agreement with Northrup's work in their clear distinction between the susceptibility of the membrane proteins and the resistance of the living organism to trypsin. The possibility, suggested by work on teleosts, of a general embryonic sensitivity to

1 Needham, J., *Chemical Embryology,* 1931, **3**, 1597.
2 Northrup, J., *J. Gen. Physiology,* 1926, **9**, 497.

TABLE I.

Material	pH	Time, 20°C	Result
1. Eggs in early cleavage stages	*ca.* 6	6 hr	Membranes fragile
2. " " " " "	" 8	3-6 "	Hatched
3. " " " " "	"	1½ "	Membranes fragile
4. Membranes removed from 3	"	6 "	Normal development
5. 4, plus tr. digestion residue	"	12 "	Development stopped

digestive enzymes is not substantiated. While this may still be the case in teleosts, it seems more likely that the injurious action of the egg contents on the embryos was due to digestion products.

The parallelism between the effects of trypsin and normal hatching in *Rana pipiens* is in agreement with the theory that normal hatching is due to a digestive enzyme. It should be pointed out in this connection that the power of trypsin to mimic normal hatching makes it useful in large scale chemical work with early stages of anurans where the presence of the difficultly removable membranes may prove a hindrance to analysis or penetration.

11333 P

Effect of Extravasated Antibody upon Antigenicity of Extracts of Virus-Induced Rabbit Papillomas.

JOHN G. KIDD.

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

Saline suspensions of virus-induced rabbit papillomas may stimulate the production of specific antiviral antibody when injected intraperitoneally into normal rabbits, as Shope found, even though they contain no pathogenic virus demonstrable by the ordinary test.[1] In experiments of the same sort we found that saline extracts containing infectious papilloma virus in quantity elicited the antibody in much higher titer than extracts in which little or none was present.[2] Other studies already reported from this laboratory have shown that the antibody often extravasates into the large, disorderly papillomas of cottontail rabbits in such quantity as to "mask" the causative virus,[3] and that the antibody can be identified as such in extracts of the growths.[4] With these findings

1 Shope, R. E., *J. Exp. Med.*, 1937, **65**, 219.

2 Kidd, J. G., PROC. SOC. EXP. BIOL. AND MED., 1938, **37**, 657; *J. Exp. Med.*, 1938, **68**, 703, 725, 737.

3 Kidd, J. G., *J. Exp. Med.*, 1939, **70**, 583.

4 Friedewald, W. F., PROC. SOC. EXP. BIOL. AND MED., 1939, **42**, 330.