and compared with 6 glomeruli from a normal 11-day chick which had already been modelled for another purpose. Those from the operated embryo (6 days and 9 hours, 17.3 mm.) were found to be larger than those from the 11-day chick, which measured 31 mm., the average volumes of the glomeruli being in the proportion of 1.2 to 1. It seems reasonable to assume, therefore, that we are dealing with a compensatory hypertrophy of the embryonic kidney which is not unlike that of the adult organ. Also, it is believed that this similarity of reaction to pathological conditions, coupled with the similarity of end products of nitrogen metabolism found in embryo and adult (namely uric acid), demonstrates a greater homogeneity of these serial excretory organs than has been recognized hitherto.

[1] Boyden, E. A., *J. Exp. Zool.*, 1924, xl, 437-472.

[2] Fiske, C. H., and Boyden, E. A., *J. Biol. Chem.*, 1926, lxx, 535-556.

[3] Boyden, E. A., and Fiske, C. H., *Anat. Rec.*, xxxiv, No. 6, in press.

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Relations between pH, Agglutination and P. D. with Bacterium Phaseoli Sojense.

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In the course of a series of studies on a group of bacteria pathogenic for plants, it was found that a strain of *Bacterium phaseoli sojense,* when plated on agar, gave colonies that were distinctly "Rough" and "Smooth". The cultural characteristics, virulence for plants and the serological reactions of these organisms have been described elsewhere.[1] We were interested in studying the agglutination reactions of these cultures, particularly because the "Rough" organisms, although more agglutinable than the "Smooth", as is generally the case, had also been found to be spontaneously agglutinated even in distilled water suspensions and after repeated washings with water.

In Table I we present the results of agglutination and P. D. (electrophoretic potential difference) measurements on suspensions prepared in distilled water after three washings with water.[2] Adjustments of pH were made by appropriate additions of aqueous HCl or NaOH solutions to the specified pH values.

TABLE I.

The influence of pH on the agglutination and P. D. of washed Bacterium phaseoli sojense in distilled water.

Smooth			Rough		
pH	Agg.	P. D.	pH	Agg.	P. D.
1.2	+	— 3.9	1.2	+	+ 3.2
1.4	+	+ 1.6	1.4	+	0
1.6	++	+ 3.9	1.6	+	+ 12.5
1.8	++	+ 7.55	1.8	+	+ 14.4
2.	++	+ 11.1	2.	+	+ 19.4
2.2	++	+ 11.9	2.2	++	+ 21.4
2.4	++	+ 13.7	2.4	+++	+ 13.8
2.6	++	+ 11.4	2.6	+++ C	+ 2.6
2.8	++	+ 10.9	2.8	+++	— 5.3
3.1	+	— 15.1	3.	++	— 18.
3.5	—	— 46.1	3.2	++	— 22.5
4.1	—	— 63.1	3.4	++	— 27.1
4.6	—	— 82.8	3.6	++	— 34.7
5.0	—	—104.1	3.8	++	— 42.8
5.3	—	—113.2	4.	++	— 42.7
5.6	—	—132.6	4.2	++	— 47.6
6.0	—	—146.3	4.4	++	— 48.1
6.4	—	—168.9	4.6	+	— 48.3
6.8	—	—147.1	4.8	+	— 47.4
7.2	—	—113.8	5.	+	— 48.1
7.6	—	—132.0	5.2	+	— 39.4
8.0	—	—149.4	5.4	+	— 38.7
8.4	—	—161.2	5.6	—	— 48.3
8.8	—	—137.2	5.8	—	— 52.3
9.3	—	— 82.1	6.	++	— 19.1
9.6	—	— 99.9	6.2	+++	— 85.0
10.	—	—118.6	6.4	+++ C	— 85.0
			6.6	+++ C	— 82.0
			6.8	+++ C	— 77.0
			7.	+++ C	— 85.0
			7.2	+++ C	— 92.8
			7.5	+++ C	— 86.6
			7.6	+++ C	— 73.0
			7.8	+++ C	—106.9
			8.0	+++ C	— 82.6
			8.2	+++ C	—119.7
			8.4	+++ C	— 88.7
			8.6	+++ C	— 90.7
			8.8	+++ C	— 83.7
			9.0	+++ C	— 85.3
			9.2	+++ C	—112.8
			9.4	+++ C	— 87.6
			9.6	+++ C	—117.4
			9.8	+++	— 98.2
			10.	++	—104.0

C. Cloudy, almost complete agglutination.
+ Slight agglutination.
++ Partial agglutination.
+++ Nearly complete agglutination.
++++ Complete agglutination.

pH, measured colorimetrically. Agglutination, measured macroscopically. P. D., expressed in nicra per second for an impressed voltage of 110 volts.

From an inspection of the data in Table I it appears that:

1. The "Rough" strain is, and the "Smooth" strain is not spontaneously agglutinable in distilled water.
2. Both strains showed marked acid agglutination.
3. Only the "Rough" showed alkali agglutination.
4. In the acidulated solution there is correlation between the effects of acidulation upon agglutination and upon reduction of the negative P. D. to approximately zero (isoelectric) or to slightly positive values.
5. There is no definite correlation between P. D. and agglutination in alkaline solutions.
6. The "critical" potentials are different for the "Rough" and "Smooth" strains.

[1] *Cf.* Sharp, *Bot. Gaz.* (in press). Link and Sharp, *ibid.*

[2] *Cf.* Falk, Gussin and Jacobson, *J. Inf. Dis.*, 1925, xxxvii, 481-494.

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Production of Toxic Substances in Vitro by Fusarium Lycopersici.

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The purpose of this research was to determine how the pathological effects characteristic of wilt of the tomato *(Lycopersicon esculentum)* are produced. This disease, which is caused by the filamentous fungus, *Fulsarium lycopersici*, is characterized by gradual or sudden loss of turgor in the leaves and stems, and generally by eventual dessication and death. Internally, the most characteristic symptom is a decided vascular discoloration (necrosis). Precedent to, or accompanying loss of turgor, local or general chlorosis of the leaves often occurs. In fact, at times, when environmental factors, particularly temperature, are not optimal for the pathogen chlorosis, and resultant retarded or arrested growth of the plant are the outstanding or only external symptoms, so that the disease resembles a show blight.

The pathogen lives primarily in the xylem elements of the host. Following the early work of Smith,[1] who established that wilting in bacterial wilt of cucurbits is essentially due to a clogging of the vessels, it has been assumed quite generally that in such vascular mycoses as tomato wilt and cabbage yellows, the parasite affects the