lactic acid of the blood has been determined in 30 cases, representing normals and hospital cases with no evident disturbance of carbohydrate, protein or fat metabolism. The bloods were obtained after a 14-hour fast, and after a night's rest, and analysed immediately. The figures varied from 11.7 to 18.0 mg., with an average of 15 mg. per 100 cc.

Clausen's method has been found applicable to the study of the lactic acid of spinal fluid. In human cases of encephalitis, brain tumor and cerebrospinal lues the lactic acid varied from 9 to 13 mg. per 100 cc. In tuberculous meningitis and meningococcus meningitis there was an increase exceeding 100 per cent of the normal, the figures were found to be as high as 22.5 mg.

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The influence of partial inactivation upon the potency of the bacteriophage.

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Bordet and Ciuca[1] believe that the bacteriophage phenomenon is a hereditary transmissible autolysis, in which the principle is generated by the bacteria themselves at a certain stage of their development under the influence of a similar lytic principle. Naturally, this conception requires the establishment of certain definite relationships between the amount of lytic principle which acts upon bacteria and the energy of the principle generated by bacteria. In their studies of these relationships Bordet and Ciuca made the following observations: The addition of a rather small amount of anti-colon bacteriophage to *B. coli* will result in only slight lysis. Furthermore, this minimal amount of the principle[2]

[1] Bordet and Ciuca, *Compt. Rend. Soc. de biol.*, 1922, lxxxvi, 295, and 1922, lxxxvi, 366 and 987.

[2] The lytic principle has to be diluted 10^{-8} aceording to Gratia, *Compt. Rend. Soc. de biol.*, 1923, lxxxviii, 629.

will induce the bacteria to generate a new principle of a weak potency. No matter what amount of this weak principle is now used, only a weak lysis will occur and a weak principle will be generated. To explain these observations these authors assume that the introduction of a very small amount of lytic principle (quantitative reduction) leads to its considerable dispersion among the bacterial cells. Therefore each bacterial cell is only very weakly impressed by this dispersed principle and thus reacts with a generation of a new principle of low energy (qualitative reduction).

It occurred to the author of this paper that instead of dispersing the lytic principle among the bacterial cells, it would be of interest to study the relationship of a partially inactivated lytic principle to the energy of generation of this principle by bacterial cells.

A method had to be chosen for partial inactivation of the lytic principle.

Since it is known that a certain hydrogen ion concentration (pH 2.8) inactivates completely the lytic principle, it was thought that a certain range of pH close to the inactivating zone could be found in which the lytic principle would be only partially inactivated.

With this intention the influence of buffer mixtures in the pH range 2.8 to 4.8 on activity of bacteriophage was studied. The following table represents the results obtained.

As is seen, partial inactivation of the lytic principle can be obtained by this method.

It is, however, impossible to state whether this partial inactivation is of a qualitative or quantitative nature. According to the experiments of Bordet and Ciuca the partially inactivated principle, be it quantitative or qualitative, should ultimately generate only a weak lytic principle. This, however, was not found to be the case, as is seen in the following experiment:

Tube of broth culture of *B. coli,* in which lytic principle previously exposed to the action of buffer pH 4.2, was diluted 10^{-4} and which showed only two plus of lysis (cf. Table), was sterilized by heating to 58° for one-half hour and the fluid distributed into a series of tubes of broth in dilution from 10^{-1} up to 10^{-8}. All these tubes were then inoculated with *B. coli.* In 24 hours *complete lysis* was obtained in all the tubes of this series.

TABLE.

pH of buffers to which anti-colon phage is exposed in dil. 1:100 room temp. 48 hours.	Degrees of lysis in tubes of broth in which each buffer mixed with phage was diluted after adjustment to pH 7.0 and into which *B. coli* was inoculated.					
	Dil. 10^{-3}	Dil. 10^{-4}	Dil. 10^{-5}	Dil. 10^{-6}	Dil. 10^{-7}	Dil. 10^{-8}
2.8-3.6	—	—	—	—	—	—
3.8	1+	—	—	—	—	—
4.0	2+	1+	1+	1+	1+	—
4.2	3+	2+	1+	1+	1+	—
4.4	3+	2+	2+	1+	—	—
4.6	4+	3+	2+	2+	1+	—
4.8	4+	3+	3+	2+	2+	1+

Reading in 24 hours.

4+ = Complete lysis.
3+ = Moderate lysis.
2 and 1+ = Slight lysis.
— = No lysis.

To sum up: I. Partial inactivation of the potency of lytic principle can be obtained by exposing the principle to the action of buffer mixtures of certain hydrogen ion concentrations at room temperature for 48 hours.

II. The lytic principle, partially inactivated by this method, induces, in contrast to the results obtained by Bordet and Ciuca, the generation of a principle of *maximal activity.*