posure for longer than 4 hours, it became relatively weaker than the chlorinated compound.

By the use of colored filters it was found that the shorter rays of sunlight were the more potent in producing the above photochemical potentiation. The glass of the fermentation tubes was tested with a mercury vapor quartz lamp and spectroscope and was found to transmit waves down to about 3000 Angstrom units. Most of the experiments with sun's rays were performed in the open, on the coast of the Atlantic Ocean at Ocean City, Md., during the summer of 1925.

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Experiments with trypanosomes in relation to the Wassermann reaction.

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The results of recent work[1] on the possibility of producing anti-bodies by means of substances apparently belonging to the class of lipoids have stimulated renewed investigation on the cause of the production of the Wassermann reagins.

Several main hypotheses relative to this subject have been considered. One of these implies that the reagins are no antibodies at all; others suppose that they are antibodies for spirochetes with an affinity also to lipoids of common origin; still another assumes that antibody formation is brought about by lipoids of the infected organism.

In analogy to the experiments on the production of heterogenetic antibodies by mixtures of proteins and alcoholic extract of organs,[1] Sachs and his coworkers[2] thought of the possibility that the production of antibodies is due to a combined action

[1] Landsteiner, K., and Simms, S., *J. Exp. Med.*, 1923, xxxviii, 127; Landsteiner, K., and van der Scheer, J., *J. Exp. Med.*, 1925, lxi, 427; Landsteiner, K., *Biochem. Z.*, 1921, cxix, 306.

[2] *D. med. Woch.*, 1925, No. 15.

of components of the spirochetes with lipoids derived from the infected animals. As a support of this hypothesis they report experiments in which it is shown that Wassermann positive sera can be produced in rabbits by the injection of alcoholic extracts of rabbit organs along with diluted pig serum.

Among our own experiments dealing with the question were such concerning the possibility of obtaining Wassermann positive sera by injections of dead trypanosomes *(T. equiperdum)*. It had been shown previously that infection of rabbits with trypanosomes *(T. equiperdum)* often results in the development of a positive Wassermann reaction.[3] Experiments by Klopstock in which he succeeded in eliciting Wassermann reactions by injecting dead *Spirocheta pallida* have been published very recently.[4]

For the selection of rabbits the Sachs-Georgi flocculation test was employed and only such whose sera gave completely negative reactions were taken for the experiments. One set of animals was treated with dead trypanosomes which had been kept over night in the icebox in a saline solution containing 0.25 per cent phenol. The quantity injected each time approximated 6 to 7 milligrams dry weight. Another set of rabbits was infected with a small dose of trypanosomes resulting in a slowly developing disease.

Leaving further details for a subsequent publication, a brief summary of the results is given in the following table. The titration of the sera in the complement fixation tests were made by halves. (0 indicates no hemolysis.)

The table records the results one month after the infection and after 4 to 7 injections of dead trypanosomes. In most cases strong reactions occurred after 3 to 4 injections.

The facts reported show that dead trypanosomes are powerful agents for inducing the formation of Wassermann reagins. They were active in distinctly smaller quantities than those of tissues or lipoids of animals used in the experiments quoted.

From the experiments of Klopstock with Spirochetes and ours with trypanosomes it would seem superfluous to assume that lipoids of the body along with components of the microbes are the operative agents in the production of the Wassermann reagins since the microbes themselves suffice to produce the effect.

[3] Landsteiner, K., Müller, R., and Pötzl, O., *Wien. klin. Woch.*, 1907, No. 46.

[4] Klopstock, F., *Deutsch. med. Woch.*, 1926, p. 226.

TABLE I.

No. of animals	Wassermann reaction with cholesterinized beef heart extract.	Sachs-Georgi flocculation.	Complement fixation with lecithin	Flocculation of lecithin	Complement fixation with alcoholic extract of Trypanosomes
		Rabbits Injected with dead Trypanosomes.			
831	0, 0, tr, v str.	+++	ac, c, c.	0	0, 0, str, c.
834	0, 0, 0, d, ac, c.	+++	c, c, c, c.	0	0, 0, 0, str, ac.
836	0, 0, 0, 0, str, c.	++++	str, v str, ac, c.	0	0, 0, 0, 0, str.
837	w, d, str, c.*	+*	v str, d, str, ac, c.	f. tr.	0, 0, w, ac, c.
838	0, 0, 0, 0, d, c.	+++	ac, ac, c.	0	0, 0, 0, tr, c.
839	0, 0, 0, 0, 0, str.	+++	w, 0, w, ac, ac, c.	+	0, 0, 0, 0, v str.
840	0, 0, 0, v str, c.	+++	d, str, c.	±	0, 0, 0, str, c.
841	d, w, str, ac, c.	++	c, c, c.	0	0, 0, f, tr, ac, c.
		Rabbits infected with Trypanosomes.			
821	0, 0, 0, 0, str, c.	+++	0, 0, 0, str, c.	++±	
822	ac, ac, ac, c	+±	c, c, c.	±	
823	str, str, ac, c.	+	0, 0, c.	+±	
824	0, 0, 0, ac, c.	+++	0, 0, f.tr, ac, c.	++±	
825	str, str, v str, c.	+±	w, 0, w, ac, ac, c.	++	
826	0, 0, 0, tr, c.	++±	0, 0, 0, 0, ac, c.	++	
827	0, 0, 0, c.	+	0, 0, v str, c.	+±	
		Rabbits infected with Syphilis.			
5726	0, 0, 0, d, c.	+++	0, 0, d, ac, c.	++±	
5570	tr, str, ac, ac, c.	+++	ac, c.	0	
5732	0, 0, w, c.	++±	0, tr, str, ac, c.	++	
5575	0, w, v str, c.	f. tr.	0, v str, c.	trace	
		Normal Rabbits.			
1	c, c, c, c.	c, c, c.	0	0	c, c, c, c.
2	c, c, c, c.	ac, c, c.	0	0	c, c, c, c.

* Tests after 7 injections. The reactions with this serum were strongly positive after 4 injections.

Whether or not the changes in the serum caused by infection are in all respects identical with those following the injection of the killed microorganism still remains to be investigated more fully. In our experiments there was a difference in the reaction when the sera from infected rabbits and from those treated with dead trypanosomes were tested with organ extracts and egg lecithin respectively as is seen from the table. Also the sera of the infected animals exhibited a strong agglutination of the live trypanosomes. In order to determine whether these differ-

ences are constant, repeated examinations at several stages during the course of the experiments seem necessary and also the investigation of infections of varying degrees of severity.

We are indebted to Dr. Kolmer for supplying us with a strain of trypanosomes, and to Dr. Brown and Dr. Pearce for the sera of rabbits infected with syphilis.

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Relation of spinal level of blood pressure to successive occlusions of head arteries in cats.

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In experiments upon the cardio-vascular responses following repeated occlusions and restorations of the circulation of the head arteries in cats, it has been repeatedly observed that the spinal level of blood-pressure, that is, the level of pressure maintained by the activity of the spinal cord alone, when the functional activity of the medulla has been eliminated, may vary between 35 and 75 millimeters of mercury.

Certain criteria are necessary to determine whether blood-pressure within this range is actually spinal pressure, since in some animals, a pressure as low as 50 or 60 mm. is sufficient to restore medullary activity, whereas in other animals, a pressure to 70 to 75 mm. may be ineffectual in bringing this about. Blood-pressure, then, may be considered spinal when

(1) its level is unaffected by occlusion or release of the head arteries.

(2) no signs of any change in level of pressure or return of any medullary reflex is observable from half to three quarters of an hour after circulation has been restored to the head arteries.

With these conditions in mind, a series of experiments was carried out, with varying numbers of successive occlusions, from 1 to 14, in normal cats. In these animals, at some stage in the occlusion series, the head arteries were permanently ligated fol-