difficult to determine the state of uterine activity exactly, especially when the contractions were not very strong.

During a few experiments not presented in the table, the uterus lacked tonus and conditions suggesting shock obtained; all venous blood was reduced. Hypertonicity of the uterine muscle apparently favored the placental exchange of oxygen (see cats 3 and 8) but when the uterus was tightly contracted, as after pitocin injection, blood vessels were occluded.

That fluctuation in the gas content of placental blood may be related to the amount of gas taken up by the fetus was indicated by experiments in cats 6 and 12. The gas values marked by the dagger (†) were obtained from blood samples drawn from distended uteri but after clamping the umbilical cords of the fetuses. In cat 6, the blood passing back to the mother from the placenta and fetus contained 6.3 volumes % oxygen but that returning from the placenta only contained 9.2 volumes %. Similarly in the other experiment results were 2.8 and 7.9 volumes %. It will be seen that these fetuses obtained about 2.9 volume % oxygen during relaxation and 5.1 volume % during contraction of the uterus.

10164 P

Adsorption of Heterophile Antibody by Pneumococci of Different Types.

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It has been shown[1] that a large proportion of strains of pneumococci of types I, II, and III contain heterophile antigen conforming to the Forssman characteristics. Experimental data establishing this point comprise both the results of active immunization of rabbits, and of adsorption of the antibody under controlled conditions *in vitro*. It has become of interest to test by the adsorptive method the heterophile-antigen content of pneumococcal strains of the higher type-numbers since the rapid typing methods have identified these types on a scale sufficiently large to merit close study of both species-antigens and type-antigens in more detail.

Heterophile antibody was prepared in rabbits by 6 intravenous injections of the usual increasing doses of heat-killed pneumococci from culture DRI, and R-variant of the Neufeld type I strain. The

[1] Bailey, G. H., and Shorb, M. S., *Am. J. Hygiene*, 1931, **13**, 831.

serum obtained a week after the last dose was heated at 56°C for 30 minutes and tested for its content of antisheep hemolysin according to the technic heretofore described.[2] The unit of sheep erythrocytes was 0.1 cc of a suspension made by adding one part of washed red cells of whole-blood concentration to 3 parts of salt solution; the dose of complement was 0.1 cc of fresh 20% guinea-pig serum.

This heterophile serum was then diluted so that 2 cc contained 50 units of lysin; 2 cc amounts were then adsorbed at 37°C for 30 minutes with 25 billion sedimented boiled pneumococci of different strains and types. The suspensions were then sedimented and the supernatant fluids, along with unadsorbed controls, were tested for their content of antisheep lysin. This test was conducted in 2 stages since the adsorbed supernatant fluids were often anticomplementary. The first stage comprised addition of a unit of sheep red cells to different concentrations of the supernatant fluids, incubation at 37°C for 30 minutes, and resuspension of the sedimented cells in fresh salt solution. This was followed by the addition of complement and reincubation for one hour. The number of units of antibody adsorbed out of a total of 50 was then computed as the original unitage minus the final unitage.

TABLE I.
Adsorption of Heterophile Antibody by Pneumococci of Higher Type Numbers.

Pneumococcus type	No. units heterophile antibody adsorbed out of 50 unit total	Pneumococcus type	No. units heterophile antibody adsorbed out of 50 unit total
4	0	14L	+45
5	40	15	45
6A	40	17	45
6B	0	18	40
7	40	20	+45
8	45	21	40
9	40	22	+45
10	45	24	+45
11	0	27	+45
12	45	31	0
13	+45	32	45
14F	45	"DRI"	45

Table I shows the results of these tests. All types* except 4, 6B, 11, and 31 adsorbed a high percentage of the 50 units of heterophile antibody to which they were exposed. Of the 4 non-adsorbing strains, 6B is said to represent the older Cooper type 26. In our hands, however, culture 6B but not 6A has agglutinated with type 6

2 Powell, H. M., *J. Immunol.*, 1926, **12**, 1.

* These were obtained through the courtesy of the National Institute of Health.

commercial typing serum. Our results showing that 19 of 23 separate group 4 types readily adsorb heterophile antibody may be compared with those of Bailey and Shorb,[1] showing that 32 of 35 "type IV" strains adsorb heterophile antibody. In all probability, however, Bailey and Shorb used larger adsorbing doses of pneumococci than we did.

In addition to the tests herewith reported we have had occasion to test the heterophile-antibody-adsorbing capacity of several pneumococcal strains belonging to types 1, 2, and 3. The type 1 strains have adsorbed a large amount, the type 2 strains a very small amount or none, while the type 3 strains adsorbed an intermediate amount of heterophile antibody. These results agree in the main with those reported by Bailey and Shorb.[1]

Conclusion. Heterophile antigen has a wide distribution in the various types of pneumococci. It is logical to assume, therefore, that heterophile antigen is at least part of the complex species-antigenic structure of most pneumococci.

10165

Excretion of Mercury Following Administration of Mercurial Diuretics with and without Theophylline.

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It has recently been shown that the addition of theophylline to the mercurial diuretics Mercurin and Salyrgan practically prevents their local toxic action[1, 2] and promotes their absorption after intramuscular injection.[3] Although Mercupurin (Mercurin with theophylline) has been found to have a somewhat greater diuretic efficiency than Salyrgan,[4-7] it remains to be proven unequivocally, however,

[1] DeGraff, A. C., and Batterman, R. C., PROC. SOC. EXP. BIOL. AND MED., 1935, **32**, 1546.

[2] DeGraff, A. C., Batterman, R. C., and Lehman, R. A., *ibid.*, 1938, **38**, 373.

[3] DeGraff, A. C. Batterman, R. C., and Lehman, R. A., *J. Pharm. Exp. Therap.*, 1938, **62**, 26.

[4] Thompson, W. A. R., *Quart. J. Med.*, 1937, **30**, 321.

[5] Crawford, J. H., and McDaniel, W. S., *Ann. Int. Med.*, 1935, **8**, 1266.

[6] Fulton, M. N., and Bryan, A. H., *J. Lab. Clin. Med.*, 1935, **20**, 1252.

[7] DeGraff, A. C., Nadler, J. E., and Batterman, R. C., *Am. J. Med. Sci.*, 1936, **191**, 526.