agglutinate in less than one minute's time. Cross-agglutination of the different types of pneumococci was tested and in no case did a heterologous serum cause any clumping. One cubic centimeter of serum per kilo of body weight was given in these cross tests.

The phagocytosis is enhanced by the accumulation of the polymorphonuclear leucocytes in the capillaries of the organs immediately after the injection of the serum. These observations corroborate the findings of Goldscheider and Jakob, that the leucopenia following intravenous injections of protein substances is due to accumulation of the leucocytes in the lungs and other organs, and not to a destruction of the cells. They also prove that the leucocytes are not killed or injured by the intravenous injection of such substances, but are still actively phagocytic.

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Notes on the surgical physiology of the dog.

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1. HYDRONEPHROSIS AND HYDROURETER.

In a previous communication[1] the possible causal relationship of a paralyzed ureter to dilatations of the ureter and kidney pelvis has been pointed out. Of the experiments performed in 1913, 75 per cent. showed hydronephrosis in some degree. Last fall the same technic was repeated in twelve dogs with the following results:

2 Negative.
6 Hydronephrosis—to some degree.
1 Hydroureter.
3 Dilatation of cephalad ureter.

Therefore fifty per cent. showed hydronephrotic change and eighty-three and one-third per cent. hydronephrotic and hydroureteric changes combined.

It was realized in applying this information to the origination of a physiological uretero-sigmoid union, some traumatization of

[1] Stewart and Barber, Hydronephrosis, Annals of Surgery, Dec., 1914, Barber and Draper, Renal infection, *Jour. Amer. Med. Assoc.*, Jan., 1915.

the transposed ureter and therefore some impairment of ureteric function was absolutely unavoidable. But making allowance for this reduced prostaltic power by the least possible *total* ureteral traumatization and by purposely confining the necessary handling to the negligible caudad third, an effort has been made to balance such impaired power by a physiologic load. To this end twenty dogs have been operated upon by transplanting one ureter in seven and both ureters in thirteen dogs. The results were as follows:

1. Direct uretero-sigmoidal entrance was found more obstructive than the oblique entrance.

2. When ureteral dilatation occurred it appeared first in the cephalad third of the ureter. This was associated in the animals having greater caudad obstruction with dilatation of the second or second and caudad thirds of the ureter and renal pelvis.

3. Each of the seven dogs with singly transplanted ureters showed hydronephrosis in some degree. The ureter in each case had been made to enter the sigmoid directly or obliquely for not over 0.5 cm.

4. Of the thirteen with doubly transplanted ureters, three showed cephalad ureteral dilatation only. These were dogs in which the ureters traversed the sigmoidal wall for 1.5 cm. The thirteenth dog with an intramural ureteral segment of 2 cm. on one side and a direct entrance on the opposing side after seventeen days of life, showed a normal kidney and ureter on the oblique and a pyonephrosis on the direct side.

2. ENTERIC DILATATION.

A. Small Intestine.

Fourteen animals have been incompletely obstructed about the iliocecal region to determine a possible dynamic change in the cephalad end of the small intestine. The conclusions have been these:

1. A fixed diameter of the caudad ileum of approximately 1 cm. (incomplete obstruction) is followed in 5.8 days by a dilatation of a duodenum of mean volume of 12.2 c.c. to a mean volume of 19.2 c.c.

2. A fixed caudad ileac diameter of 0 (complete obstruction) is followed by a contraction of a mean duodenum of 14 c.c. to a mean of 6.25 c.c. in five days. A similar result was noted after acute gangrenous typhlitis and incomplete obstruction of the cephalad colon.

B. Colon.

Six experiments have been performed on the colon. Incomplete obstruction of the extreme caudad colon for a mean of 10.75 days was followed by a dilatation of a cecum of a mean volume of 18 c.c. to a cecum of 29.5 c.c.

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Nephelometric study of the proteins of cerebro spinal fluids.

I. RELATION OF EUGLOBULIN, TOTAL-GLOBULIN AND TOTAL-PROTEIN TO WASSERMANN REACTION.

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INTRODUCTION.

In syphilitic diseases of the nervous system the composition of the cerebrospinal fluid has become of increasing importance. On the exact chemical picture of the fluid, especially from a quantitative standpoint nothing has been done. It is true, the proteins and to some extent the phosphorus have been roughly estimated and in some cases correlated to the Wassermann reaction.

For this deficiency of quantitative data the reason is found in the lack of material; the present chemical methods used heretofore having been too crude for the low concentration of substances in the very small amounts of fluid.

Since the development of nephelometry the quantitative