cases, the values were approximately a third less and in one case less than a half.

The relationship, if any, of the incidence of pneumonia in the adults to lead poisoning is unknown.

In view of Hindle's[4] report, an attempt was made to transmit the inclusions to animals fed standard diets. Kidney suspensions were prepared in broth-saline and injected subcutaneously into rats, mice and guinea pigs. Two experiments were performed using freshly harvested kidneys known to contain inclusion bodies. In one case blind passage was performed to the third generation. Ten rats, fourteen mice and two guinea pigs were injected. Inclusions were found in none.

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## ANTAGONISM BETWEEN HEPARIN AND PLASMA TRYPSIN

HEPARIN was found to inhibit the digestive action of crystalline trypsin upon casein[1, 2] and the lack of inhibitory action upon commercial trypsin[3] was ascribed by Horwitt[4] to the probable presence of indefinite amounts of chymotrypsin in those preparations to be found in the market, since chymotrypsin is not inhibited by heparin. On the other hand, heparin is being largely used as therapeutic agent in thrombosis and recently[5] it was reported the protective action of heparin against necrosis produced by extreme local cold (frost bite). Since activation of plasma trypsin might constitute a common mediator in many manifestations following thrombosis and platelet disintegration, we have found it advisable to study the effect of heparin upon the proteolytic enzyme found in normal plasma. Trypsin is present in plasma in a free (I) and a bound (II) condition[6,7] and can be estimated following precipitation either with acetone (I) or with a 2.5 per cent. solution of trichloracetic acid (II), incubation of the whole precipitate (resuspended in buffer pH 8.4) for 48 hours and final estimation of the N P N. Heparin added either before precipitation or after the preparation was set up for incubation, had a strong inhibitory effect as shown in Table 1.

TABLE 1

| Exp. No. | Material used | Amount of heparin* added | Trypsin (mgm NPN/100 ml plasma) | |
|---|---|---|---|---|
| | | | Total | Free |
| I | (a) dogs plasma | 0 | 91.4 | 31.9 |
| | (b) same + heparin | 2 mgs | 85.6 | 3.5 |
| | (c) same + heparin | 5 mgs | 34.8 | −1.0 |
| II | (a) dogs plasma | 0 | 114.0 | 19.4 |
| | (b) same + heparin | 10 mgs | 12.6 | 4.8 |
| | (c) same + heparin | 10 mgs | 49.1 | ... |

* The heparin used in those experiments was a crystalline-sodium salt of beef heparin (11 units per mgm) kindly supplied by Dr. L. B. Jaques of Toronto, Canada.
Note: In experiment II c, heparin was added after precipitation by trichloracetic acid and immediately before incubation.

The fact that heparin displays a definite inhibitory effect upon plasma trypsin when added before activation of the enzyme by addition of trichloracetic acid might be explained by assuming that it strengthens the effect of the natural inhibitor present in plasma. This agrees with Ferguson's view[7] that the polypeptide-like inhibitor of trypsin present in plasma might have acidic groups analogous to those of heparin or that heparin might constitute a prosthetic group for this inhibitor. A more extensive report will follow this note.

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# SCIENTIFIC APPARATUS AND LABORATORY METHODS

## THE USE OF A PLANIMETER IN VOLUME STUDIES OF EARLY EMBRYOS

THE shape of developing ova after the first cleavage division does not allow accurate volume calculation on the basis of diameter or radius, a fact which must at least partly explain the absence of data pertaining to this problem.

The volumes of more than eighty ova and blastocysts have been successfully ascertained by the planimetry of serial sections of known thickness.

Serial ten micron sections of the specimens were projected at two hundred diameters of magnification and the outline of each section was accurately traced on suitable paper. The average of ten planimeter readings was taken for each section and the values

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