preparations given intravenously may be concentrated in the tissue by increasing the capillary permeability through the use of counter irritants. Neoprontosil has been observed to localize and concentrate in areas of the rabbits' skin when it was given intravenously immediately following the local application of xylol. A complete study will subsequently be made on the localization of blood-borne materials in areas of inflammation.

The indications are from my observations that increased capillary permeability is of brief duration following injury where xylol is applied and apparently is a phenomenon distinct from that by which leucocytes reach the area of inflammation. The two phenomena however frequently occur together.

The results obtained in these experiments on the relation between the time of application of xylol to the skin of rabbits and the time of localization and concentration of trypan blue following an intravenous injection are similar to the observations of Kline and Winternitz.[3] The latter investigators found that when pneumonia was produced in rabbits with vital stain in their circulation, the involved lung had a uniform blue color; if, however, the dye was injected sometime after the pneumonia developed (20-65 hours) pale gray consolidated areas occurred in the otherwise densely blue stained pneumonic lobes.

**10794 P**

## *In vitro* Incorporation of Fatty Acids in Phospholipids of Intestinal Mucosa.*

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Sinclair,[1] using elaidic acid, found that phospholipids of the intestinal mucosa after feeding fat, contained some of that fed fat. Perlman, Rubin, and Chaikoff[2] later showed that fed, radioactive phosphorus also became incorporated in the phospholipids of the

3 Kline, B. S., and Winternitz, M. C., *J. Exp. Med.*, 1915, **21**, 311.

* Aided by grants from the Rockefeller Foundation and the National Live Stock and Meat Board.

1 Sinclair, R. G., *J. Biol. Chem.*, 1929, **82**, 117.

2 Perlman, I., Rubin, S., and Chaikoff, I. L., *J. Biol. Chem.*, 1937, **122**, 169.

intestinal mucosa. Both of these findings have been repeatedly confirmed. Robinson, *et al.*,[3] have also shown that slices of intestinal mucosa incubated in a Warburg apparatus with radioactive phosphorus would bring about an incorporation of radioactive phosphorus in the mucosal phospholipids. Using the conjugated, unsaturated fatty acids of corn oil as a tagged fat[4] the *in vitro* incorporation of fatty acids in the intestinal mucosal phospholipids has been studied.

Male, albino rats were anesthetized with ether and their abdomens opened. Three cc of an emulsion containing bile salts, lipase (pancreatin), water, and tagged fat† was injected into the duodenum and the abdomen closed. After 15 minutes the rats were again etherized and the intestines washed with saline, then alcohol and finally with more saline. After a 15-minute absorption period about 30% of the total fat in the mucosa will be tagged fat. The mucosa of 2 rats was freed from intestinal muscle and immediately placed in a boiling water bath for 5 minutes. The intestines of the other animals were placed in beakers of normal saline and allowed to incubate at room temperature for various lengths of time. In the experiment marked with an asterisk (Table I) the intestines were slit lengthwise and placed in oxygenated, glucose Ringer's at 37°C. There was no alcohol used in washing these intestines. In each case when the incubation time was complete the mucosa was removed and immediately placed in a boiling water bath. The mucosal samples were then frozen, dried and extracted. The tagged fat

TABLE I.

| Incubation time hr | Increase in total phospholipid tagged fat in dry mucosa % | Phospholipids in dry mucosa % | Increase in phospholipid fatty acids as tagged fat % |
|---|---|---|---|
| 0.00 | 0.00 | 8.0 | 0.0 |
| 1.75 | 0.08 | 3.4 | 3.3 |
| 2.75 | —0.04 | 2.3 | 1.9 |
| 4.50 | —0.06 | 1.1 | 3.9 |
| 6.00* | 0.03 | 1.6 | 6.7 |

*This sample was incubated in oxygenated, glucose Ringers at 37°C.
Each figure is from the combined intestinal mucosa of 2 rats.

[3] Robinson, A., Perlman, I., Rubin, S., and Chaikoff, I. L., *Nature*, 1938, **141**, 119.

[4] Miller, E. S., Barnes, R. H., Kass, J. P., and Burr, G. O., PROC. SOC. EXP. BIOL. AND MED., in press.

† Assistance in the preparation of these materials was furnished by the personnel of Works Progress Administration Official Project No. 665-71-3-69, Subproject No. 6714.

being determined by the method of Miller, *et al.*[4] The fatty acids of the control phospholipids were 1.4% tagged fat. This value was subtracted from that found after incubation and the difference expressed as percent increase in phospholipid fatty acids as tagged fat.

The results in Table I show that on incubation there is an increase in the ratio of tagged fat to untagged fat in the mucosal phospholipids (last column). This would suggest an enzymatic replacement of the phospholipid fatty acids in the incubating tissues. However, there is a steady decrease in the total phospholipids during the incubation period so that the total phospholipid tagged fat (second column) remains constant. The total phospholipid tagged fat is a function of the ratio of tagged fat to untagged fat, and the percent phospholipids in the tissues. A lowering of either of these two factors will result in a decrease in the total tagged fat. In the experiments presented in Table I it is seen that the increase in the ratio of tagged fat to untagged fat is just balanced by the decrease in the percent of phospholipids so that the resulting total phospholipid tagged fat does not significantly change. As yet no explanation of this change is offered, although there appears to be a preferential destruction of the untagged phospholipids.

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## Effect of Sulfanilamide and Sulfapyridine on Experimental Infections with *Listerella* and *Erysipelothrix* in Mice.

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Within the past few years the literature on the use of sulfanilamide and other related compounds has grown very large. Clinical and experimental results have demonstrated the value of these substances in certain infectious diseases particularly in those infections caused by bacteria of the family *Coccaceæ*. Long and Bliss,[1] Marshall[2] and others have fully reviewed the literature on this subject and no attempt will be made to repeat their work in this short paper.

We[3] noted recently a case of acute meningitis in a small boy resi-

[1] Long, P. H., Bliss, E. A., and Feinstone, W. H., *J. A. M. A.*, 1939, **12**, 115.

[2] Marshall, E. K., Jr., *Physiol. Rev.*, 1939, **19**, 240.

[3] Wagner, G. W., and Porter, J. R., unpublished data.