involve sympathetic amines, but might be mediated directly or through some other intermediate process. The above data certainly indicate that vagotomy-induced pathological processes in lung and mesentery are not identical.

Summary. The Rb^{86} and P^{32}-orthophosphate permeability of mesentery removed from vagotomized guinea pigs in terminal stages of pulmonary edema was greater than the permeability of mesentery from control animals. The exposure of guinea pigs to air diluted with nitrogen, producing a sometimes fatal anoxia, did not alter mesothelial permeability or lung weight. Exposure of vagotomized animals to an atmosphere rich in oxygen failed to prevent an increase in mesentery permeability or in lung weight. Vagotomy, however, did not alter the permeability of mesentery taken from reserpine-pretreated animals, although high lung weights indicated pulmonary edema. Because it is improbable that vagotomy affected the permeability *only* of mesenteric mesothelium, increased permeability of pulmonary membranes may play a role in vagotomy-induced pulmonary edema, whether or not hemodynamic abnormalities are also important. The results with reserpine, however, prove that the mechanism is not identical in lungs and mesentery.

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Rapid Appearance of Injected Fat in the Gut of the Rat. (28219)

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In studies undertaken to develop a method of measuring reticuloendothelial function in man, intravenous injections of fat emulsions were given to rats. This material was chosen since it has been used extensively for intravenous alimentation in man(1). The emulsion was specially prepared "Lipomul I.V.,"* a 15% emulsion of cottonseed oil, dispersed with Pluronic F-68 (non-ionic detergent) and lecithin in 5% dextrose. An oil soluble dye, "Fluorescent Green H. W. 185%"† was added to the oil prior to emulsification (20 mg/g cottonseed oil). At this low concentration the dye did not affect the stability of the emulsion and the ultimate distribution of the oil could be determined by following the distribution of fluorescent material.

The emulsion was injected into the femoral veins of rats (0.1 ml/100 g rat) and 0.1 ml samples were removed from the tail at time intervals. The samples were diluted to 25 ml with acetone and shaken for one hour. This

* Kindly supplied by Upjohn Co., Kalamazoo, Mich.

† Supplied by Wilmot and Cassidy, Inc., New York.

procedure dissolved the dye and precipitated the plasma proteins. After centrifuging, the supernatants were examined in a spectrophotofluorimeter, using an activating wave length of 3500 Å and measuring the fluorescence at 5500 Å. Under these conditions bile pigments also show some fluorescence but the resulting error is negligible. The percentage transmission against time curves indicate the rate of removal of fat from the blood and hence the phagocytic function of the reticular endothelial system.

Animals injected as above were sacrificed at time intervals and various organs examined to determine the site of accumulation of fat. The organs were removed, blotted dry with filter paper and weighed. They were crushed in 25 ml of acetone and shaken for 2 hours. No attempt was made to flush out the blood from these organs, hence the readings were all slightly high due to the emulsion contained in the blood circulating within the organ. However, in view of the high dilution of the emulsion in the blood, the amount contained in the vascular bed of any organ can be considered negligibly small. After filtration, the filtrates were examined in the spectrophotofluorimeter. The intestinal contents above the colon were washed out with 0.145 M NaCl, then treated as above.

The curves showing rate of disappearance from the blood stream were typical of those for colloid clearance and exhibited an exponential rate of disappearance(2). At the end of 30 minutes, however, the curves often showed a slight increase in fluorescence suggesting the resorption of the dye and (therefore) fat through the intestinal wall and back into the blood stream. This effect has been noted previously for sulphobromophthalein sodium by Lorver and Shay(3).

The distribution of the recovered dye 30 minutes after injection is shown in Table I.

Accumulation of dye in the duodenum was found very soon after intravenous injection. This was observed by examination of the dissected animal under an ultra violet light source when the areas containing dye showed a yellow-green fluorescence. Fig. 1 and 2 show photographs taken on super-speed Ortho

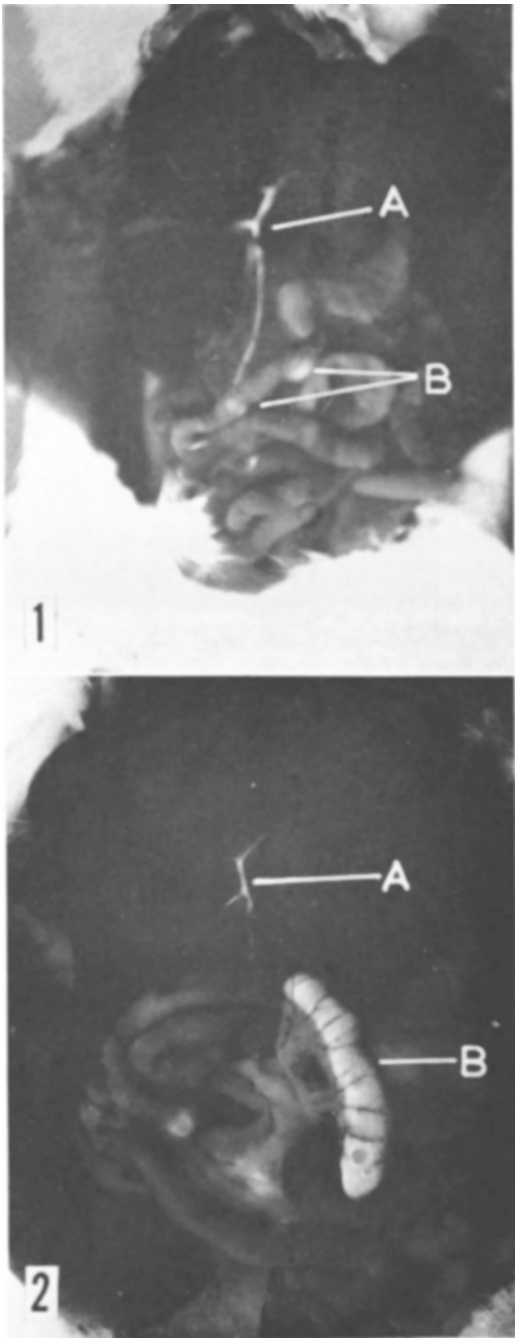

FIG. 1. Photograph of rat sacrificed and dissected 3 min after injection of 0.5 ml of emulsion. Fluorescence can be observed in bile duct (A) and 2 areas of the duodenum (B).

FIG. 2. Photograph of rat sacrificed and dissected 30 min after injection of 0.5 ml of emulsion. Fluorescence can be observed in bile duct (A) and lower intestinal tract (B).

TABLE I. Spectrophotofluorimetric Determinations Showing Distribution of Dye Recovered 30 Minutes After Injection.

Organ	% transmission
Intestinal contents	49.5
Liver	37.1
Kidneys	4.9
Spleen	1.2
Lungs	1.6
Intestinal wall	4.6

film using a yellow-green filter with a U.V. lamp as the only source of illumination. The fate of intravenously administered fat emulsions has been widely considered in view of the use of such emulsion for intravenous administration(1). The clearance mechanism has been considered by other workers and the majority implicate the reticuloendothelial system. The high concentration of dye in the liver and the exponential disappearance from the blood stream are in accord with their view. However, presumptive blocking of fat uptake by the reticuloendothelial cells with such agents as carbon black, causes no significant change in rate of removal from the blood(4).

The appearance of the dye (and hence fat) in the duodenum, especially so rapidly after injection, is surprising if one considers the process to involve phagocytosis and subsequent transport systems. These results are interesting in view of the observation by Juhlin(5), that spheres of polymethylmethacrylate are also transported to the bile within minutes after injection into rabbits. Juhlin found a dependence upon particle size, large particles (0.2-0.8 μ diam.) rarely entering the bile and smaller particles (0.02-0.11 μ diam.) entering rapidly. In the present work, the particle size, though not accurately determined, is of the order of 0.2-0.7 μ diam.(6). In the preparation of fat emulsions for intravenous feeding it has generally been assumed that the particle size should be as small as possible. In view of the above findings this view may need to be considerably modified (1).

Summary. Oil emulsions containing a fluorescent dye were given intravenously to rats. Rate of removal from the blood stream was typical for reticuloendothelial clearance of a colloid. The emulsion accumulated in the liver but appeared in the bile duct and duodenum within minutes after injection. Approximately one-half of the dye was found in the intestinal contents.

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Metabolic Adaptations in Higher Animals. VIII. Effect of Diet on Ornithine-α-Ketoglutarate Transaminase.* (28220)

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Glutamate-oxalacetate (GOT) and glutamate-pyruvate transaminase (GPT) activities are affected by dietary and hormonal treatments(1-3). Several other transaminases have been identified in mammalian tissues (4-10) but there have been few studies of effects of diet on them.

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