(*b*) At high rates of shear, or under turbulent conditions, the rupture of red cells (such as mechanically-induced hæmolysis or breakage) may lead to a clot formation of a distinctly different type. This mechanism is now under consideration.

The present series of tests confirms the results obtained in the pilot series[7], and appears to confirm the hypothesis that the increased thixotropy and viscosity of blood (at low rates of shear) are symptomatic of the thrombotic condition. The work continues now on a larger scale in order to substantiate further all deductions and to test the applications of micro-rheological theories and techniques to some cardio-vascular problems.

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Absorption of Chymotrypsin from the Intestinal Tract

THE primary objective of work reported here was to determine whether an intact enzyme can be absorbed from the gastro-intestinal tract of adult animals retaining its enzymatic activity.

Plasma enzyme-levels obtained after rectal and intestinal administration of chymotrypsin to healthy, adult, New Zealand White rabbits were compared to those obtained after intramuscular administration. The enzymatic activity appearing in the circulation following the administration of chymotrypsin was measured by the hydrolysis of *N*-acetyl-L-tyrosine ethyl ester (ATEE)[1]. Quantitation was accomplished by comparing the plasma activity with chymotrypsin standards dissolved in the plasma of the animal being studied. The plasma enzyme-levels shown in Fig. 1 represent mean values obtained from five rabbits receiving 10 mg/kg intramuscularly; five rabbits, 20 mg/kg intra-intestinally; and seven rabbits, 20 mg/kg rectally. In all cases the endogenous enzyme-level determined just prior to administration of chymotrypsin was less than 1·0 μg/10 ml. in terms of chymotrypsin activity, and in most cases it was less than 0·5 μg/10 ml.

It can be seen that a significant increase in enzymatic activity results after administration by all three routes. It remained to be shown, however, that this activity was that of chymotrypsin. When chymotrypsin is added to plasma or administered to rabbits, esterase activity against ATEE and benzoyl phenylalanine naphthol ester (BPNE) was obtained, but no activity against tosyl arginine methyl ester (TAME) or benzoyl arginine ethyl ester (BAEE) could be detected. The analytical procedure used for BPNE was a modification of that described by Ravin[2]. The procedures for TAME and BAEE were modifications of that used for ATEE[1]. The specificity obtained eliminates the possibility that the esterase found was plasmin, thrombin, urokinase, or the esterase derived from the first component of complement[3].

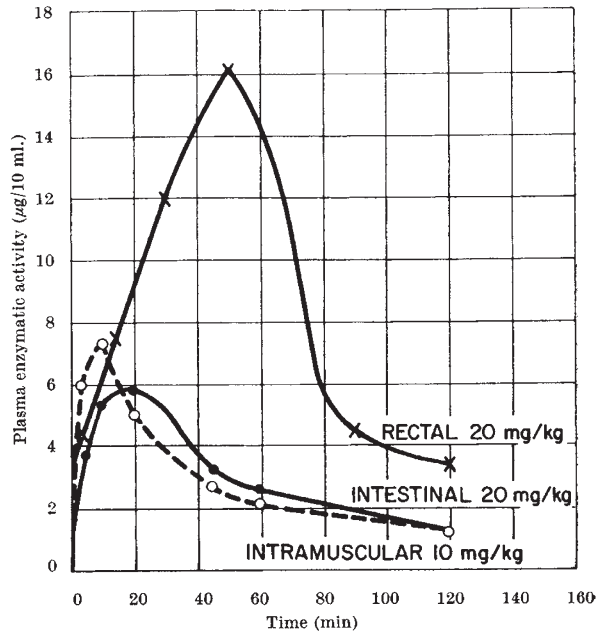

Fig. 1. Mean plasma levels after administration to rabbits

In order to characterize further the esterase appearing in the blood after chymotrypsin administration, we determined the hydrolytic activity of the plasma against two substrates, ATEE and BPNE, after rectal administration of the enzyme at several dosage-levels. The activity of aqueous solutions of chymotrypsin at several concentrations against the same two substrates was also determined. The *in vitro* activity ratio (ATEE/BPNE) was found to be $1{\cdot}82 \pm 0{\cdot}16$. After rectal administration the ratio was $1{\cdot}78 \pm 0{\cdot}49$. It appears, then, that chymotrypsin has been absorbed from the gastro-intestinal tract in an enzymatically active form.

Preliminary results with adult human subjects indicate that here, too, chymotrypsin is being absorbed from the gastro-intestinal tract.

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Cæsium–Choline Interaction on Muscle Membrane

IT has been observed that the depolarizing effect of cæsium ions on membrane potential of frog muscle fibres increases when external sodium concentration is replaced by a so-called inert osmotic substitute, such as choline chloride[1]. This dependence on sodium choline of the depolarization of cæsium was in contrast to the independence of the sodium–choline observed on the potassium depolarization.