liver aliesterases¹¹; when given 4 and 24 hr. previously in the rat, it did not substantially inhibit the permeability effect of histamine, 5-hydroxytryptamine, the histamine-liberating compound 48/80 or rat-serum factor.

The use of diisopropyl phosphofluoridate has enabled us to establish more firmly the hypothesis that the globulin permeability factors are proteases. The drug is also useful for distinguishing the permeability effects of the globulin from those of other endogenous factors. Diisopropyl phosphofluoridate has no *in vitro* effect on histamine, tested in all three species of animal, or on compound 48/80 and 5-hydroxytryptamine, tested in the rat. But its use as an *in vivo* reagent for identifying effects due to the globulin factors is limited by its toxicity in concentrations that might be expected to inactivate proteases. Thus, 0.1 ml. of 10^{-4} M diisopropyl phosphofluoridate given intracutaneously is sufficient to induce local fibrillation in the muscles of the skin. Given systemically, diisopropyl phosphofluoridate is likely to be even less useful for this purpose, because in non-toxic doses it will effect mainly the numerous esterases of the body susceptible to concentrations of the order of 10^{-8} – 10^{-9} M.

In contradistinction to the observations of Spector and Willoughby¹² in the rat, in our hands only obviously toxic doses of systemic diisopropyl phosphofluoridate decreased the action of globulin permeability factors injected intracutaneously in both rats and guinea pigs. In any event, the action of the globulin factors is not exclusively affected, since the permeability effects of histamine, compound 48/80 and 5-hydroxytryptamine in rats and guinea pigs are depressed to the same extent.

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Equilibration of Labelled Magnesium between Sheep Plasma and Red Cells

The following work was undertaken to determine the rate of transfer of magnesium across the sheep erythrocyte membrane held in a stable *in vitro* system. It is considered that such information should be of value in the elucidation of the etiology of hypomagnesaemia.

Samples of heparinized sheep blood, to which a known percentage of isotonic glucose containing carrier-free magnesium-28 had been added, were incubated for different periods at 40° C. During this incubation frequent aeration with a water-saturated gaseous mixture of 5 per cent carbon dioxide and 95 per cent oxygen was carried out. A layer of paraffin above the blood prevented the interchange of gases between the blood and its environment except during aeration. After each relevant period the particular sample was centrifuged under paraffin, pH measured and the plasma and erythrocytes separated. The magnesium-28 was counted in each sample and its total magnesium estimated chemically by way of ammonium vanadate (Rook, J. A. F., private communication).

Fig. 1. Magnesium-28 exchange between plasma and red cells of sheep blood

The changes with time of the specific activities of the plasma and erythrocyte magnesium were determined (Fig. 1). The rate of transfer of magnesium between the extracellular and intracellular compartments was calculated by the method used for potassium exchange¹. It amounted to 3.4 per cent of the plasma magnesium content per hour.

In order to investigate any effect exerted by pH on this magnesium transport, the above experiment was repeated at different blood pH's. The results showed no significant effect of pH on the rate of transport of magnesium between plasma and erythrocytes *in vitro* over the pH range studied (7.26–8.07).

The above work, in detail, along with its extension to *in vivo* experiments with sheep, will be published shortly elsewhere.

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