and antipyrine was used in all experiments as a reference substance. The experiments showed that compounds with a high oil–water partition coefficient disappeared most rapidly from the perfusate while compounds with low water–oil partition coefficient disappeared at a slow rate. The results thus point to a lipoid barrier between blood and liver tissue which seems to be qualitatively similar to the blood–brain barrier. In a second experiment drug penetration into the liver tissue was studied by using tissue slices. This means that drugs could enter the cells from the incubation fluid without passing through the walls of the blood vessels. In these experiments no important differences in the rate of penetration of the various compounds could be detected. This suggests that the main obstacle for the penetration of drugs is located within or in the close vicinity to the walls of blood vessels.

64 The Inhibitory Effect of Sodium Lauryl Sulphate on the Intestinal Absorption of Glucose and its Potentiation of Phloridzin. J. A. NISSIM (United Kingdom).

The inhibitory effects of cationic quaternary ammonium germicides, such as trimethylhexadecylammonium stearate, cetrimide and domiphen, on the intestinal absorption of nutrients have been described previously.(1) Striking enhancement of inhibitory activity on the intestinal absorption of both glucose and sodium butyrate was achieved in cetrimide–phloridzin combinations, which was of the order of 50–100 times for the former and 10–15 times for the latter.(2)

These studies have now been extended to sodium lauryl sulphate. This is an anionic surface-active germicide, which showed no histological injury to the intestinal mucosa when perfursed or injected. The compound was perfused into the intestine of pure strain C3H mice with 0·2 per cent glucose in normal saline (25 ml) in half-hour experiments. Values of the percentage absorption of glucose are given in Table 1, and are compared with those obtained with cetrimide.

Sodium lauryl sulphate exhibited a weak inhibitory effect as compared with cetrimide or phloridzin. The potency ratio of lauryl-phloridzin combinations to phloridzin alone, however, was 5·8 with fiducial limits at P = 0·01 of 12·3 and 2·9, while the potency ratio of cetrimide-phloridzin combinations to phloridzin was 16·2 with corresponding fiducial limits of 40·7 and 7·6. Striking reduction of glucose absorption was shown by surfactant-phloridzin combinations at concentrations of the drugs which possessed no inhibitory activity whatever when perfused along (first column). Further, in spite of poor intrinsic activity, sodium lauryl sulphate showed considerable phloridzin-potentiating effect, which was only 1/3γ1/2 that of cetrimide.

Table 1

Percentage absorption of glucose. Figures represent mean of four experiments except where number is indicated in brackets. Control percentage absorption in 27 mice = 35·4 ± 1·1

Substance	Concentration of substance in perfusion fluid					
	0·001%	0·002%	0·01%	0·02%	0·1%	0·5%
Cetrimide	46·6	30·4(10)	24·1		3·7	
Phloridzin	34·3(8)	19·6(8)	10·8(8)		−0·9(8)	
Sodium lauryl sulphate			34·9	28·3	20·8	19·0(3)
Phloridzin[1] +Cetrimide	7·0	5·1	−1·6			
Phloridzin[2] +S.L.S.	16·5	8·4	−0·4			
Phloridzin[1] +S.L.S.			2·3			

(1) Equal conc.
(2) S.L.S. conc. 10 times that of phloridzin.

1. NISSIM, J. A. (1960a), *Nature (Lond.)*, **185,** 222; (1960b), *Nature (Lond.)*, **187,** 305; (1960c), *Nature*, **187,** 308.
2. NISSIM, J. A. (1961). Submitted for publication.

65 Intestinal Absorption Influenced by Calcium-binding Substances. E. SÖGNEN (Norway).

The presence of calcium-binding substances (Ca-b.s.), EDTA, sodium fluoride and sodium oxalate, in the gastrointestinal tract reduces the effect of orally administered drugs. Thus lethal oral doses of strychnine or barbiturates leave the animals unaffected or only slightly influenced when given concomitantly with Ca-b.s. A decreased plasma level of barbiturate and sulphonamides is found in experimental animals, compared to controls as previously reported.

Further study has revealed that the decreased plasma concentration is not due to increased renal excretion. The influence of Ca-b.s. on factors determining the rate of intestinal absorption has therefore been more closely studied.

Perfusion experiments on isolated small intestine *in situ* and experiments on isolated everted loops of small intestine *in vitro* have shown that the transmucosal translocation of water, glucose and sulphonamides and the utilization of glucose, is reduced by Ca-b.s.

The retard rate of transmucosal translocation is supposed to be caused by the effect of Ca-b.s. on glucose metabolism.

In the intact animal the observed alteration in gastric and intestinal fluid transport results in a dilution of the initially administered solution.