fifth of the time required by the latter. The length of the lethal dose of radiations for these two forms is about in the same proportion.

It can be shown that one of the physical effects of the radiations is to increase the permeability of the cells by injuring the cell wall. If the treatment is long enough continued the cells cytolyze completely. From this it follows that when cells are already highly permeable, as they are during growth and division, complete cytolysis quickly ensues: whereas when the cell membrane is relatively impermeable, as it is in resting cells, radiation must be long continued before destructive cytolysis can be observed.

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The effect of increase of blood pressure on the concentration of colloidal dyes in the plasma.

By F. H. SCOTT, M. RABINOWITZ, and A. RUPP.

[*From the Department of Physiology, University of Minnesota, Minneapolis, Minnesota.*]

Great changes in the number or volume of the corpuscles, or in the haemoglobin content of the blood may occur in a very short time. In using corpuscles or their derivatives as the indicator of the concentration of the blood one meets with the objection that there might be hidden masses of corpuscles ready to be put into the circulation in times of stress. No evidence exists for such masses of corpuscles and it is well known that dilution of the blood may take place equally as rapidly as concentration. In the case of the dilution caused by haemorrhage

one of the authors[1] showed the fluid coming in from the tissue spaces was almost pure salt solution having a protein content of only 0.6 to 2 per cent. If changes in the concentration of the plasma could be shown when the blood becomes concentrated in corpuscles, it would get away from all objections of hidden masses of corpuscles.

In the experiments recorded here the concentration of injected congo red has been followed in the plasma. This method is not ideal for all phases of this problem because there is normally a gradual decrease in its concentration. Thus, according to Harris,[2] considering 100 as the percentage after the dye has been uniformly mixed with the plasma there is a fall of about 4 per cent. in five minutes. This is however, slower than with vital red. This figure is not fixed and sometimes we found larger figures than that and sometimes less. If, after this second sample of blood has been taken, the blood pressure be raised by the injection of adrenalin or by section of the vagi and a third sample taken after a few minutes, one finds the concentration of congo increased. Thus, in one instance nineteen minutes after injection of congo and fourteen minutes after the first sample of blood containing congo had been taken we have found 111 per cent. of congo in the plasma as a result of adrenalin. This was in an 18 kilo. dog. The dog had about 693 c.c. plasma to commence with and this would mean about 63 c.c. of fluid had left the blood provided no congo had left in the time. Because congo is leaving the blood all the time the method of following dyes can give only relatively crude figures, but they show such results as were obtained by one of the authors[3] when the haemoglobin change was followed, are due to fluid leaving the blood and not to hidden masses of corpuscles. They indicated that the colloid of the blood does not leave the blood as fast as the water. The changes in the concentration of the natural colloid of the blood are being investigated.

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[1] *Journal of Physiology*, 1916, l, 157.

[2] *Brit. J. Exp. Path.*, i. 162.

[3] *American Journal of Physiology*, 1917, xliv, 298.