proteins (colloids): this was taken up by a co-worker of mine, Dr. H. J. M. Creighton.* Briefly stated his conclusions were: colloids such as gelatine and egg-white reduce soluble Prussian blue with great rapidity at 100°C, in about half an hour at 60°C, while the reduction is barely perceptible at room temperature at the end of many hours. It was shown that the protein formed a colourless compound with the pigment, and that reduction was due to the removal of a positive ionic charge. Seeing, then, that fresh liver or kidney juice at room temperature can reduce soluble Prussian blue to the leuco condition within sixty seconds, the agent operative in the case of colloidal reduction is not that which we have been investigating in tissue-juices.

We think it is possible that these colloidal phenomena worked out by Creighton are the reductions which Heffter has studied. Heffter holds that the so-called reductase reductions are not vital (enzymic) but are all due to the interaction of colloids and pigments. He says that crystallized egg-albumen can effect reduction. The blood-proteins certainly cannot do so either at room temperature or at 40°C.

Now, however interesting and important the study of the action of reductase on various pigments and other salts capable of reduction may be, we have to remember that none of them is even approximately the natural medium of the tissues and most of them are distinctly toxic for the living substance. Nothing other than oxyhæmoglobin is the natural substance yielding the oxygen dealt with by tissue reductase. Dr. Creighton and I have recently, therefore, made a systematic investigation into the relationships of reductase and oxyhæmoglobin in solution, a research which has brought to light many fresh data. The method used was spectroscopic: that is, the change from the two-banded spectrum of oxyhæmoglobin to the one-banded spectrum of fully reduced hæmoglobin was followed with a direct-vision spectroscope. There are two advantages in this method; the first that the reductase was acting, as it were, in its own proper substrate, the respiratory pigment oxyhæmoglobin, the second that the end-point was as accurate as could be obtained in a spectroscopic method. The personal factor was practically eliminated. As the mixture of juice and diluted blood was examined from moment to moment, the two bands were seen gradually to fade away and be replaced by the single fainter band of the reduced pigment. The change of colour

* Creighton, H. J. M., Nova Scotian Inst. Sci., 13, (2), p. 61, (1911-12).