flask used for the incubation. Some parameters studied are listed in Table 2 together with the mean values of three different blood samples. Some examples of application will be given.

1. Beutler, E. *Blood* **14** (1959) 103.
2. Prankerd, T. A. J. *Am. J. Med.* **22** (1957) 724.
3. Löhr, G. W. and Waller, H. D. *Klin. Wochschr.* **37** (1959) 833.
4. Bartlett, G. R. *J. Clin. Invest.* **39** (1960) 56.
5. Brin, M. and Yonemoto, R. H. *J. Biol. Chem.* **230** (1958) 307.

Dilatometry in the Study of Acyl Shift in Peptides and Proteins

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The dilatometer technique as described by Linderstrøm-Lang [1] has been introduced in our studies on the formic acid induced reversible inactivation of protein enzymes [2-4] in order to elucidate the mechanism of the reactivation process.

From our previous studies three reactions were thought possible in this process, namely 1. an O,N-acyl shift, 2. deformylation of the formylated amino groups, or 3. deformylation of the formylated hydroxyl groups of the hydroxyamino acid residues.

Therefore the volume changes accompanying some proton transfers as well as the O,N-acyl shift in some model substances have been determined in addition to those accompanying the reactivation of formic acid inactivated protein enzymes.

The volume change accompanying the reactivation of ribonuclease when performed in phosphate buffer, *i. e.* 15.3 ml per equivalent base consumed, is in good agreement with that accompanying the proton transfers in the neutralisation of formic acid with secondary phosphate ions, *i. e.* 15.7 ml. In contrast, the value found for an O,N-acyl shift is 21.1 ml. Thus the data strongly suggest that the reactivation is based on a deformylation process.

Dilatometer experiments on formic acid treated glycyl-DL-serine as well as glycyl-O-formyl-DL-serine further suggest that the deformylating process is a splitting of the formamid bond in the O-acyl formed structure.

1. Linderstrøm-Lang, K. in Myrbäck, K. and Bamann, E., eds., *"Methoden der Enzymforschung"*, Leipzig, 1940.
2. Josefsson, L. and Edman, P. *Biochim. Biophys. Acta* **25** (1957) 614.
3. Josefsson, L. *Arkiv Kemi* **12** (1958) 183.
4. Josefsson, L. *Arkiv Kemi* **12** (1958) 195.