As seen in Table 1, under the prevailing experimental conditions, no phosphorylation can be reconstructed by ATP and Mn^{++} in the system resuspended in new incubation medium, or in the original supernatant. When boiled supernatant, or a boiled extract of fresh mitochondria is used as a suspending medium, reconstruction of phosphorylation again becomes possible. This indicates that the falling yield of the reconstructed phosphorylation, previously observed to occur on prolonged preincubation in Mg^{++}-free medium, may be accounted for by a destruction, probably enzymic in nature, of the released factor.

1. Ernster, L., Lindberg, O. and Löw, H. *Nature* **175** (1955) 168.
2. Ernster, L. and Löw, H. *Exptl. Cell Research* **Suppl. 3** (1955) 133.
3. Ernster, L., Löw, H., Nordenbrand, K. and Ernster, B. *Exptl. Cell Research* **9** (1955). *In press.*

Rapid High Precision Conductivity Recorder

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For studies of enzymatic degradation of peptides and proteins and micelle formation in bile salt solutions as well as for conductometric titrations we needed a conductivity recorder of high precision and rapid response, stable enough to follow small resistance changes over long periods of time. Several automatic recording devices have been described in the literature (*cf.* Refs.[1,2]). Most of these have been constructed for use as detectors in chromatographic analysis and none appeared to have the desired combination of high sensitivity, speed, and stability needed for our purposes. This also applied to commercially available instruments.

We have, therefore, converted a Shedlovsky precision bridge[3] into a high precision resistance recorder in the following manner.

The bridge is fed from a 1 000 c/s r.c. oscillator. The detector signal from the bridge is amplified by a three stage logaritmic amplifier which prevents overloading of the recording system for large unbalance signals. The amplified signal is rectified by a phase sensitive homodyne detector of the type described by Kinell[4]. The filtered output from the homodyne is fed to a Speedomax G recorder. To the potentiometer shaft of the recorder is mechanically coupled a linear high precision potentiometer which forms parts of two arms of the bridge, the moving contact being connected to the detector amplifier. A signal from the bridge makes the recorder pen move until the resistance balance of the bridge has been restored through the potentiometer attached to the pen movement. In order to prevent hunting in the servo system an adjustable velocity feed back to the recorder amplifier is provided from a D.C. generator geared to a balance motor of the recorder. Through a variable shunt across the potentiometer coupled to the pen, the resistance change for full scale response of the recorder may be adjusted over a 1:200 range (*e. g.* 10:2000 Ω). The speed of response is practically that of the recorder (4.5 secs. in the Speedomax G used). The lock-in amplifier detector system used gives a very low noise level which makes the recorder detect smaller resistance changes than the human ear using head phones. A sensitivity of 2 parts per 100 000 has been reached with no detectable noise in the recordings. Applications will be described.

1. Drake, B. *Arkiv Kemi* **4** (1952) 401.
2. de Verdier, C.-H., and Sjöberg, C. I. *Acta Chem. Scand.* **8** (1954) 1161.
3. Shedlovsky, T. *J. Am. Chem. Soc.* **52** (1930) 1793.
4. Kinell, P.-O. *A spectrophotometric study of polymethyl methacrylate*, Diss. Uppsala 1953.

Studies on Pancreatic Lipase

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A simple and rapid method for the determination of pancreatic lipase activity is described. It is based on the rate of clearing of a triolein emulsion by the lipase.

Using this assay method lipase from human and rat pancreatic juice has been purified by salt precipitation and electrophoresis on starch block according to Kunkel. The purest fractions so far obtained have an activity approximately 1 500 times that of extracts from acetone powder of pancreatic glands (calculated per mg of protein) (viokase).

No evidence of any esterase activity in human or rat pancreatic juice has been found.

The effect of bile acids, fatty acids and some other substances on the rate of hydrolysis of triolein by purified lipase will be described.