Apparatus and Method. The apparatus consists of a rectangular brass box (140 mm length, 95 mm height and 95 mm width) which is inserted instead of the usual absorption cell compartment between the photo-tube housing and the monochromator of the DU-Beckman Quartz Spectrophotometer (Figure 1). This box has openings on both sides in the light path of the spectrophotometer and a circular opening (69 mm diameter) on its top, to accomomdate a paper-strip holder (Figure 2).

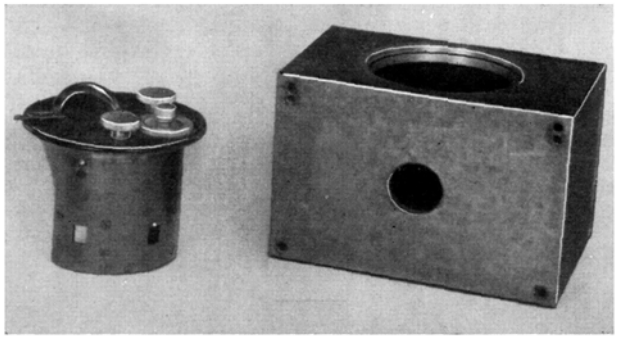


Fig. 2.–Attachment disassembled.

The paper-strip holder consists of a top-covered brass tube of which one half has been cut away, containing two split shaft spindles, a third indicator spindle to which a rubber disc is attached, and a guiding metal frame. The paper strip (17 mm width) is wound on the split shaft spindles. When moving, it passes between a window (9 × 7 mm) and the metal frame, rotating the rubber disc of the indicator spindle which measures the distances travelled by the paper strip with the help of a calibrated metal disc and a pointer. The calibrated metal disc is divided into 50 sectors, each one equivalent to 1 mm distance. A second framed window of exactly identical dimensions and a metal clip for the blank paper are

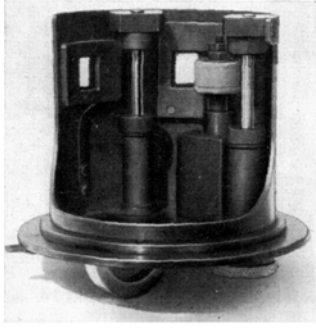


Fig. 3.–Paper-strip holder.

located in some distance from the sample window. By rotating the paper-strip holder in the circular opening of the above-mentioned box, these two windows can be brought into the light path successively, both of them being located next to the photo-tube housing. All parts of the attachment are blackened, so as to avoid the reflection of light (Fig. 3 and 4).

The measurement is carried out as follows: after compensating the dark current, the blank window is brought into the light path, the wave length dial adjusted and the selector switch is set on "check". The photo-tube shutter is opened, and the apparatus compensated by means of the slit width and sensitivity knobs; then the shutter is closed again. The selector switch now is set on the 0·1 position, the sample window is brought into the light path by rotating the paper-strip holder in its box, the shutter is opened and the galvanometer compensated by turning the Density knob. The absorbance read is recorded.

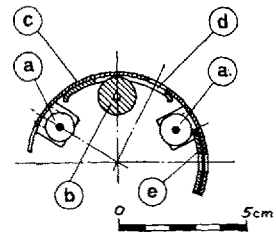


Fig. 4.–Horizontal cross-section of the Paper-Strip Holder. *a* Split shaft spindles. *b* Rubber disc of the indicator spindle. *c* Tube wall. *d* Sample window with metal guiding frame. *e* Blank window with metal guiding frame.

The scanning is carried out at several wave lengths in succession. The dark current is balanced, the wave length dial adjusted, the Density knob set at zero (100 % transmittance), and the selector switch set at 0·1 position. Then the shutter is opened, and the instrument balanced by adjusting the slit width and the sensitivity. One scans by opening the shutter and balancing with the Density knob without changing the slit width or the sensitivity. Measurements are made every 5 mm.

For the determination of Rf-values, scanning is carried out as described, but at the wave length of the absorption maximum of the particular substance.

In case the chromatogram proves to be too dense, its transmission can be increased by immersing the paper strip in paraffin oil which, of course, has to be transparent at the wave length used.

A detailed description will be published elsewhere.

The author is indebted to Mr. JOEL RAWICZ for the construction of the instrument. This investigation has been carried out under the auspices of the Scientific Department, Israel Ministry of Defence.

CH. EGER

Scientific Department, Ministry of Defence, Tel-Aviv, Israel, August 20, 1955.

Zusammenfassung

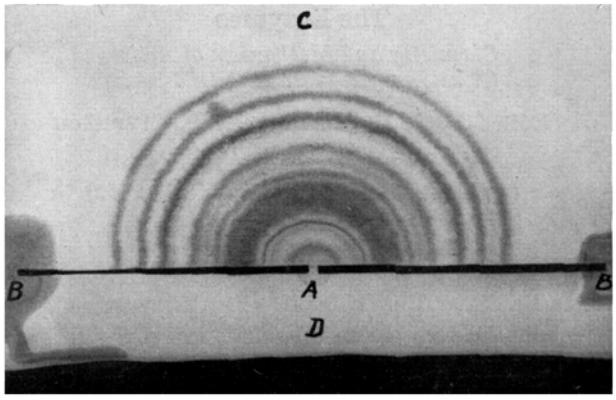
Mit der Hilfe eines neuen Zusatzinstruments zum Beckman-Quarz-Spektrophotometer ist es möglich, die Absorptionsspektra isolierter Substanzen auf Papierchromatogrammen zu messen. Ferner erlaubt das Instrument die Bestimmung der Rf-Werte nach der Methode von TENNENT und Mitarbeitern.

PRO EXPERIMENTIS

Use of Large Filter Paper Sheet in Circular Paper Chromatography by Descending Technique

The use of a large size of filter paper is found to give better resolution of substances in circular paper

chromatography[1]. Filter paper circles of 35 cm diameter are always found to give better defined separation of substances than filter paper circles of 18 cm diameter. But irrigation of large diameter filter paper requires a special type of apparatus[2] which again is sometimes difficult to procure. In the present communication a method is described in which large filter paper sheets can be irrigated in the usual chromatographic chambers used for two-dimensional purpose by the descending technique.



Whatman No. 1 filter paper sheet (50 × 32 cm) was used for the purpose. Two parallel straight lines are drawn, 5 mm apart at a distance of 7 cm from the shorter portion of the paper sheet. Now, in order to give the solvent a radial flow, two long slits are made along these parallel lines leaving a small 5 mm width portion *A* (Figure) at the centre of the long parallel lines and 3 cm width *B* (Figure) portions at the ends of these parallel lines. The central 5 mm portion *A* will now act as the passage of solvent flow from the solvent reservoir to the main sheet. The end portions *B* are not cut out in order to give the paper sheet an additional support. In order to restrict the passage of the solvent flow from supply source *D* (Figure) through the central connecting paper passage *A*, the portions *B* which also connect the main paper *C* with solvent supply source are sealed up with paraffin wax as shown in the Figure. Naturally, the solvent will now flow through the constriction *A* and spread radially throughout the main paper sheet. The substance to be chromatographed is spotted at the position *A* and the whole paper then carefully fitted in a glass trough and placed in a chromatographic chamber for saturation of the paper with the particular solvent, as is done in descending type of chromatography. About 50 µl containing 30–40 µg of individual amino acids can be chromatographed. After a saturation period of 24 h, the solvent (*n*-Butanol:acetic acid:water = 4:1:1) is poured into the trough in the chamber and the paper is developed in the descending way as usual. The solvent, after passing through the passage *A*, takes a period of 24 h to travel a radial distance of 25 cm.

Using this method, it is very convenient to develope paper of a larger size (57·5 × 47 cm) radially to avoid the special type of apparatus. The paper sheet serves the purpose of a paper circle of double size. The separation achieved by this method is quite satisfactory, as can be seen from the accompanying photograph (Figure) of a chromatogram of a protein hydrolysate developed with *n*-Butanol:acetic acid:water (4:1:1). The method is successfully applied in quantitative estimation of amino acids.

Thanks are due to Dr. S. C. Roy, Department of Applied Chemistry, Calcutta University, for his kind interest in the work.

N. C. Ganguli

Department of Applied Chemistry, University College of Science and Technology, Calcutta-9, India, August 20, 1955.

Zusammenfassung

Es wird eine Methode für die Anwendung grosser Papierbogen bei Kreispapierchromatographie beschrieben. Eine Chromatographiekammer für absteigende Technik wird verwendet. Durch einen in der Mitte unterbrochenen Schlitz parallel zum Papierrand und durch Paraffinimprägnierung der seitlichen, nicht durchtrennten Ränder wird der Radiärfluss des Lösungsmittels erreicht. Die Trennung der Aminosäuren eines Proteinhydrolysats gelingt so besser als bei Verwendung kleiner Filterpapiere.

[1] K. V. Giri, *Nature 171*, 1159 (1953).
[2] K. V. Giri and N. A. N. Rao, J. Ind. Inst. Sci. *34*, 95 (1952).

Nouveaux livres - Buchbesprechungen - Recensioni - Reviews

Sample Survey Methods and Theory

By M. H. Hansen, W. N. Hurwitz, and W. G. Madow

Vol. I: *Methods and Applications*, 638 p.
Vol. II: *Theory*, 332 p.
(John Wiley & Sons, New York, 1953)

Nicht nur in den Wirtschaftswissenschaften, dem klassischen Anwendungsgebiet der «Statistik», sondern auch weit darüber hinaus haben sich in den letzten Jahrzehnten neben den vollständigen Erhebungen und Zählungen die Stichprobenerhebungen in zunehmendem Masse durchzusetzen vermocht. Den Grund hierfür darf man wohl darin sehen, dass Stichprobenerhebungen rascher und billiger, und in vielen Fällen auch zuverlässiger, die gewünschte Information über die Struktur oder über typische Eigenschaften einer Gesamtheit von Dingen oder Individuen zu vermitteln vermögen, als dies umfassende Erhebungen zu tun in der Lage sind.

In den beiden Bänden geben die Verfasser, die an der Entwicklung der neuen Stichprobenverfahren selber