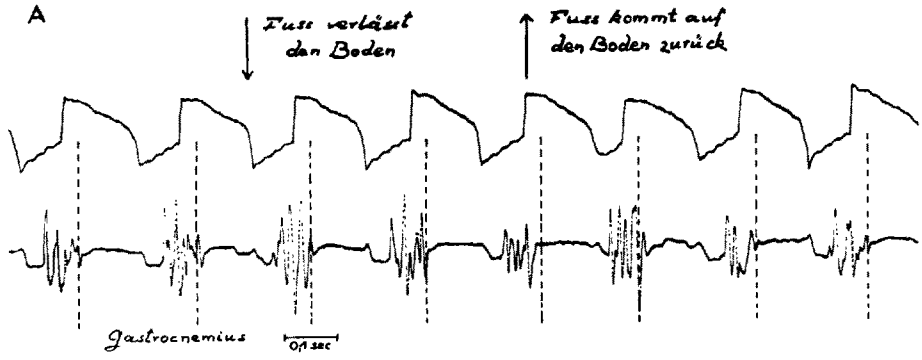

Abb. 2. Elektromyogramm des Gastrocnemius beim Menschen: schnelles willkürliches Hüpfen. Hier bezeichnet die gestrichelte Linie den Zeitpunkt, zu welchem ein Dehnungsreflex (monosynaptisch) erwartet wird. Die Deflektionen der oberen Grundlinie markieren in allen Abbildungen die Momente, in denen der Fuss sich vom Boden löst (Deflektion nach unten) oder auf den Boden zurückkommt (Deflektion nach oben).

durch folgenden Befund: Vom Beginn des Aktionsstromes bis zum Start der mechanischen Bewegung liegt eine beachtliche, individuell verschieden lange Latenz. Sie ist bei rascher Rhythmik von der gleichen Grössenordnung wie die Zeitspanne zwischen Innervationsbeginn und Wiederauftreten des Fusses. Somit fällt der durch die jeweilige Innervation hervorgerufene mechanische Effekt mit dem Momente der Dehnung zusammen!

In einer solchen Kette rascher, rhythmischer Willkürbewegungen, wie dieser hier während des Hüpfens, steckt in jedem Innervationsstoss bereits der «rebound» der vorhergehenden Entladung, welcher auf die geschilderte Weise die eigentliche Aufgabe des Eigenreflexes, das Abbremsen des Aufschlages nämlich, vorwegnimmt. Und zwar zeitlich präziser, weil er im entscheidenden Moment wirklich da ist und nicht noch, wie der Reflex, eine beträchtliche Zeit erfordert. Zu bedenken, wenn auch an dieser Stelle nicht weiter auszuführen wäre noch, dass sehr wohl monosynaptische Reflexe im Verlaufe der Innervation selbst, als sogenannte «Anspannungsreflexe» (HOFFMANN[6]) auftreten können und dass die rhythmischen Hemmungsphasen zu einem guten Teil der autogenen Muskelhemmung (GRANIT[7]) zugeschrieben werden müssen (HUFSCHMIDT[8]). Warum nun der Eigenreflex trotz adäquatem Reiz im Verlaufe der raschen Willkürkontraktion *nicht* auftritt, ähnlich wie auch der «Entlastungsreflex» unter gleichen Bedingungen (SOMMER[9]), bleibe vorläufig dahingestellt.

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Neurologische Universitätsklinik Würzburg, Luitpold-Krankenhaus, den 11. Oktober 1955.

Summary

A short time after a quick voluntary movement, there is no evidence of a monosynaptic reflex (Eigenreflex) following a stretch of the same muscle. Thus rhythms of voluntary movements may exist without interaction of stretch reflexes.

[6] P. HOFFMANN, Nervenarzt *24*, 19 (1953). – Hierher gehört auch die initiale Bahnung der Motoneurone im Verlaufe einer Muskelkontraktion [R. GRANIT, J. Neurophysiol. *13*, 351 (1950)].

[7] R. GRANIT, J. EEG clin. Neurophysiol. *2*, 417 (1950).

[8] H.-J. HUFSCHMIDT, Pflügers Arch. *260*, 210 (1955).

[9] J. SOMMER, Dtsch. Z. Nervenheilkde. *150*, 83 (1939).

PRO LABORATORIO

An Attachment for the Measurement of the Absorption Spectra on Paper Chromatograms

Searching for a general method for the detection and quantitative determination of glycyrrhizinic acid and other substances in licorice root and licorice extract, the ascending paper strip chromatography as described by GOOTJES and NAUTA[1] was applied. The prescribed colour reaction with Rhodamin B in 1 N sulfuric acid is, however, specific for glycyrrhizinic acid only, so that other compounds present cannot be detected.

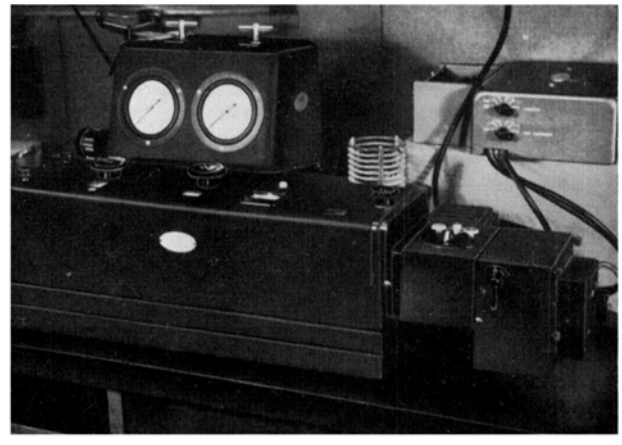

Fig. 1.–Attachment assembled.

An attachment to the Model DU-Beckman Quartz Spectrophotometer was, therefore, developed which permits the scanning of the paper chromatogram, the determination of the Rf-values of its components by the method of TENNENT and co-workers[2], and the measurement of the absorption spectra of the individual substances forming spots. It makes unnecessary the elution of the spots and even colour reactions in those cases, in which the substance has a characteristic absorption spectrum.

[1] J. GOOTJES and W. TH. NAUTA, Rec. Trav. chim. *73*, 886 (1954).

[2] D. M. TENNENT, J. B. WHITLA, and K. FLOREY, Anal. Chem. *23*, 1748 (1951).

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).

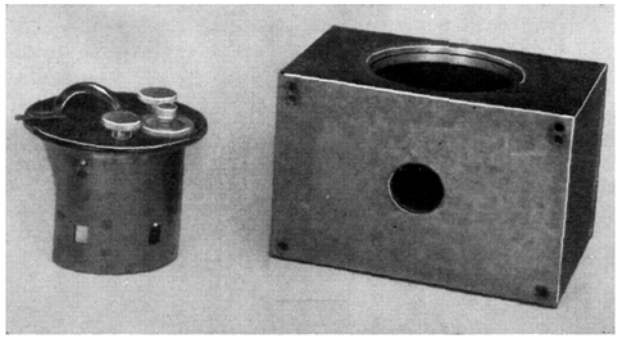

Fig. 2.–Attachment disassembled.

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

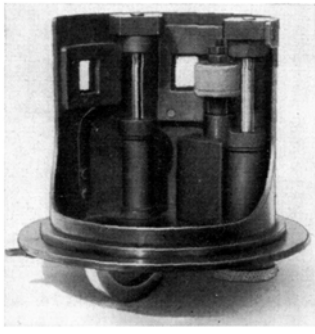

Fig. 3.–Paper-strip holder.

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.

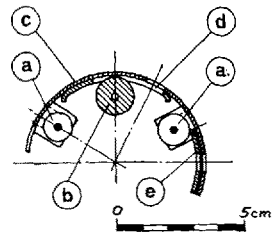

Fig. 4.–Horizontal cross-section of the Paper-Strip Holder. *a* Split shaft spindles. *b* Rubber disc of the indicator spindle. *c* Tube wall. *d* Sample window with metal guiding frame. *e* Blank window with metal guiding frame.

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