revealed that the C57 control embryos developed somewhat slower than the Swiss albino control embryos (Table I and II), as indicated by crown-rump length attained. On days 7 and 8 of gestation, the increase in size of C57 embryos was less than that of Swiss albino embryos (Table III, group 1 and 10, 2 and 11). On the 9th, 10th, and 11th days, the C57 and Swiss albino embryos did not differ significantly with respect to crown-rump length (Table III, group 3 and 12, group 4 and 13, 5 and 14), and by the 12th day, the 2 strains diverged again, and the Swiss albino embryos surpassed the C57 embryos in growth (Table III, group 6 and 15).

Discussion. The present data show an influence of the genetic background on the response of embryonic mice to the teratogenic action of trypan blue similar to that first reported for other agents by DAGG[2,3], FRASER[4,5], FRASER and FAINSTAT[6], LANDAUER[9], LANDAUER and BLISS[10], and RUGH, GRUPP and WOHLFROMM[11].

Although the C57B1/6J and Swiss albino strains differ in developmental rate, as indicated by differences in the crown-rump measurements, it is unlikely that differences in developmental timing operate to influence the distinct response of the embryos of the 2 strains to trypan blue. Treatment of Swiss albino mice as early as day 6, when embryos of this strain presumably resemble the stage of maturation characteristic for C57 mice at day 7, was never accompanied by the type of total developmental arrest that was displayed by the C57B1/6J embryos obtained from mothers treated on day 7.

The second point deserving comment concerns the observation that in Swiss albino mice, unlike C57B1/6J mice, the incidence of abnormalities diminishes with advancing embryonic age, so that on the 12th day of gestation the frequency of malformed embryos, obtained from Swiss albino mothers injected with trypan blue, decreased from 69.4% on day 10 to 25.4% on day 12 of gestational age.

Since the average litter size remained unchanged between days 10 and 12 of gestation (Table II), the decrease in incidence of abnormalities with advancing fetal age is, therefore, best explained by assuming that repair may be taking place during this period in the Swiss albino strain, while capacity for repair seems to be altogether lacking in C57B1/6J embryos. The possibility that differential capacity for repair of the embryos may be one of the genetic strain differences underlying their variability of response to an external teratogen deserves further study[12].

Zusammenfassung. Die Wirkung des Farbstoffes Trypanblau auf die embryonale Entwicklung von 2 Mäusestämmen, des C57B1/6 Stammes und des Swiss-Albino-Stammes, wurde untersucht und die Ergebnisse wurden miteinander verglichen. Embryonen der beiden Stämme reagierten in verschiedener Weise auf Trypanblau. Die Injektion des Farbstoffes führte zum vollständigen Entwicklungsstillstand aller C57B1/6-Embryonen, während bei Swiss-Albino-Embryonen hauptsächlich Kopf-, Gehirn- und Schwanzabnormitäten auftraten. Bei Swiss-Embryonen nahm die Schwere der Abnormität mit fortschreitendem Alter der Embryos beträchtlich ab, obwohl die Anzahl pro Wurf unverändert blieb. Keine Veränderung in der Zahl der Abnormitäten wurde in älteren C57B1/6-Embryonen beobachtet. Die verschiedenartige Reaktion der beiden Stämme auf Trypanblau ist vielleicht darauf zurückzuführen, dass genetisch bedingte Unterschiede in der Fähigkeit, zerstörtes Gewebe während der embryonalen Entwicklung zu reparieren, vorhanden sind.

M. HAMBURGH and VERONICA CALLAHAN[13]

Department of Biology, City College of New York (N.Y. 10031, USA), 2nd January 1967.

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Der Ursprung des dorsalen Herznervs der Lithobiiden (*Chilopoda*)

Die Chilopoden besitzen einen Nerv, der das Herz dorsal begleitet und innerviert. Er wurde deshalb als «dorsaler Herznerv» beschrieben[1]. Eine Verbindung dieses Nervs mit dem Zentralnervensystem konnte durch diese histologischen Untersuchungen ebensowenig wie später durch embryologische Beobachtungen[2] festgestellt werden. Es wurde daher gefolgert, dass der dorsale Herznerv ein «selbständiges System» bilde[3]. Vom Standpunkt der vergleichenden Anatomie aus ist diese Annahme sehr unwahrscheinlich. Deshalb war die Möglichkeit ins Auge gefasst worden, dass der Herznerv wenigstens über segmentale Nerven des Bauchmarks mit dem Zentralnervensystem in Verbindung stehen könnte[4], wie es von einigen Cheliceraten und Insekten bekannt ist. Diese Vermutung wurde schliesslich bestätigt[5]. Der caudale Nerv eines jeden Ganglions gabelt sich unmittelbar nach seinem Austritt. Ein Ast zieht an die Dorsalseite und gibt einen sensorischen Anteil an das Tergum, einen motorischen vor allem an die dorsale Muskulatur ab. Ein Zweig des motorischen Anteils gelangt über die Muskulatur hinweg zum Herz und mündet dort in den dorsalen Herznerv ein. Seine Axone zeichnen sich besonders durch den Gehalt an Neurosekret aus[5].

Bei histologischen Untersuchungen über das stomatogastrische Nervensystem der Chilopoden konnte nun bei *Lithobius piceus* Koch ausser der segmentalen Verbindung

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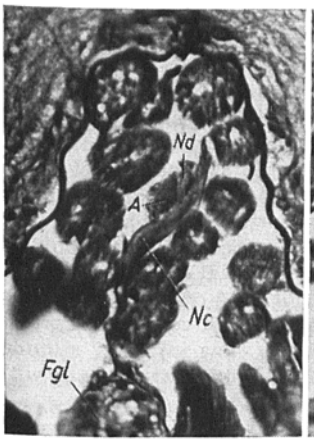

Fig. 1

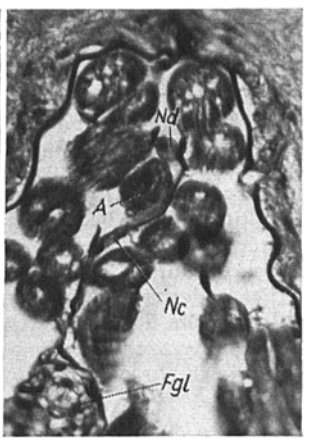

Fig. 2

Figuren 1 und 2. Zwei aufeinanderfolgende Schnitte einer Transversalschnittserie durch den Kopf von *Lithobius piceus*. Susa, Masson. × 800. (A) Aorta cephalica, (Fgl) Frontalganglion, (Nc) Nervus connectivus, (Nd) dorsaler Herznerv.

auch der Ursprung des dorsalen Herznervs im Zentralnervensystem gefunden werden. Vom Frontalganglion, das über eine breite Stomodaealbrücke mit den Tritocerebralganglien beiderseits verbunden ist, zieht dorsal vom Nervus recurrens ein schwacher unpaarer Nervus connectivus caudad. Dieser mündet in den Medianteil des primären Syncerebrum, das Verschmelzungsprodukt von Proto- und Deutocerebrum, ein. Wie Figur 1 zeigt, gibt der N. connectivus auf halber Strecke einen ventralen Nebenzweig ab. Dieser schmiegt sich an das Dach der hier endigenden Aorta cephalica und begleitet diese und später das Herz eben als dorsaler Herznerv (Figur 2). Der dorsale Herznerv von *Lithobius piceus* ist also ein Visceralnerv des stomatogastrischen Systems, der im Ganglion frontale wurzelt. Ausführlichere Untersuchungen werden an anderer Stelle veröffentlicht.

Summary. In *Lithobius piceus* Koch the dorsal cardiac nerve is a branch of the nervus connectivus, and thus a nerve of the stomatogastric system. It arises from the frontal ganglion.

G. Seifert

Zoologisches Institut der Universität, 5 Köln-Lindenthal (Deutschland), 15. Dezember 1966.

Reflex Inhibition of Cold Shivering by Pressure to the Skin and the Histological Investigation of its Afferent Spinal Pathway

Considerable interest has been attracted to the question of non-specific inhibition of vegetative and extrapyramidal motor regulatory processes concerned with thermoregulation, such as sweating and cold shivering. Inhibition of sweating in man as a consequence of postural changes[1,2], or mechanical skin pressure applied to the skin[3] has been experimentally studied and has been proved to be the effect of pressure to the skin. The central mechanism of the 'skin pressure reflex' has not yet been clarified conclusively[4]. However, recently, it was reported that cold shivering of the rabbit was markedly inhibited by pressure to the skin or eye-balls[5,6]. To find out the afferent spinal pathway concerned with the reflex inhibition of cold shivering due to pressure to the skin, various kinds of partial cordotomy have been performed in rabbits. The results of acute experiments in rabbits have indicated that the important part in the spinal cord concerned with the afferent pathway of this reflex is not in the dorsal funiculus. This has been confirmed in the present investigation which was performed in 6 chronic rabbits with partial cordotomy.

Results. Figure 1 shows a recording of the reflex inhibition of cold shivering by pressure to the eye-balls and skin in a chronic rabbit which had been submitted to partial cordotomy in the ventral funiculus at Th12 segment in the left side. 14 days after operation, this recording was performed under the following conditions. The chronic rabbit lightly fixed on all fours was exposed in cold environment to produce cold shivering, which was recorded electromyographically from the M. triceps brachii of the left forearm. As is shown in Figure 1 (A), cold shivering was markedly inhibited by bilateral eyeball pressure of about 200 g/cm² applied by an ophtalmodyanomometer. Figure 1 (B) shows the inhibitory effect on cold shivering due to mechanical pressure of about 3 kg per 20 cm² applied by a paper holder mantled by rubber to the left side of the lumbar skin innervated from below the partial cordotomy. Tonic and phasic discharges of cold shivering were inhibited in these 2 cases. However, the same strong mechanical pressure applied to the right side of the lumbar skin had only a slight inhibitory effect on cold shivering as shown in Figure 1 (C). Identical observations were made in 5 more rabbits with chronic transection of the left ventral funiculus: inhibition of cold shivering by skin pressure to the ipsilateral lumbar region, and almost no inhibition by pressure to the contralateral side. The result indicates that the afferent pathway of the reflex inhibition of cold shivering due to pressure to the skin must cross at the spinal level.

19 days after partial cordotomy, the rabbit was killed to follow up the degenerated fibres ascending in the ventral funiculus. Considerable degeneration was found in the ventral funiculus closely rostral to the lesion (Th12), however, rostral to Th8, the number of the degenerated fibres gradually diminished. A certain amount of the degenerated fibres was found at C8 level, and from here up to C1, no more diminishing of the number of the degenerated fibres was observed. In Figure 2, a lot of dark small dots located in the left ventral funiculus of C7 spinal segment

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