6 simple geometric figures, then to write down in a given order the results of the following 4 arithmetic exercises: 3 single operations (division, multiplication or addition) and a combination of 3 successive operations, each of all these operations being simple enough as to create no handicap for the backward pupils. This test was meant to give us some indications of the influence of noise on the faculties of attention and reasoning.

The noise diffused during the tests were either pure sounds of 40, 250, and 1000 Hz respectively, or the following pre-recorded environment noises: 1. traffic noise (in a noisy cross-road), 2. airplane noise (near the airport of Geneva-Cointrin) and 3. 'text' (a text read with the rhythm used for speech in the radio in order to simulate radio playing while the pupils are doing their home-work).

A number of methods like the 'articulation index' (AI)[8], the 'speech interference level' (SIL)[9] etc., have been devised in order to evaluate the intelligibility of speech in the presence of various types of determined noises. In this paper, we shall give all our results using the simpler dB_A scale[5].

The mean losses (in %) for each group and each test in the presence of the environment noises mentionned at various levels (in the succession: 65, 55, 75 and 45 dB_A respectively) are summarized in the Table. Despite the small number of subjects in the 2 groups, the following (statistically significant) results can be drawn: 1. The losses in performance of the future teachers are lower than those of the pupils up to (and including) 65 dB_A; at 75 dB_A, although increasing for both groups, the losses are greater for the teachers. 2. A nocivity threshold (threshold where the losses start to increase more rapidly with the elevation of the noise level) can be detected at around 55 dB_A for the pupils and at around 65 dB_A for the teachers. 3. As expected, in the first test the losses in the audition of logatoms are much higher than the losses in the audition of known words (which are in turn higher than the losses in the audition of sentences)[5]. 4. With regard to the first part of the second test, we note that the losses are low (except at 75 dB_A); this result shows that the faculty of attention of both groups is not distracted by the noise (except at higher levels) because of the interest expressed by the participants in performing those tests; it is therefore very important to develop the motivation of the pupils towards the teaching they receive.

When the two tests are conducted in the presence of disturbing pure sounds of 40, 250, and 1000 Hz respectively (no tabulated presentation given here), the losses observed are much lower than those in the presence of environment noises (which exhibit complex spectra) and are more important at 250 Hz than at 1000 or 40 Hz. The losses calculated separately for the advanced pupils and for the backward pupils indicate that the advanced pupils do much better than the backward pupils; the differences, however, tend to vanish with the elevation of the noise level above 55 dB_A, especially for the losses in the audition of logatoms.

Although this study, which will be published in more detail in French elsewhere, should be extended to larger groups of pupils and teachers, we should like to draw once more the attention of the teaching staffs not only to the nocivity of noise in the school environment, but also to the fact that backward pupils resent the interference of noise to a much higher degree than the advanced students.

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Effect of Ascorbic Acid on Pigmentation of Toad (*Bufo melanostictus*)

N. M. BISWAS and S. ROYCHAWDHURY[1]

Department of Physiology, Calcutta University, 92, Acharya Prafulla Chandra Road, Calcutta-700 009 (India),
25 August 1975.

Summary. Administration of ascorbic acid in toad during breeding season results an increase in melanin pigments in skin, liver and vocal sac.

The role of sex steroids in the synthesis of melanin pigments has been reported in the rat[2] and bird[3]. Previous in vivo and in vitro studies indicate that testicular steroid hormone synthesis in toad appears to be increased by exogenous ascorbic acid (ASA)[4–6]. The influence of ASA on the pigmentation in toad is obscure. A significant fall of ASA in the testis[7] and the melanin pigments in the skin[8] has been observed in the hypophysectomized toad. From these observations, it seemed desirable to determine whether ASA had any role in melanin formation in toad.

Materials and methods. 16 male toads, weighing about 60 g, were used during the breeding season. The animals were divided into 2 groups of equal number. 1 group of animals received ASA (50 mg/100 g of body weight) by i.m. route. The remaining animals received 0.4 ml of amphibian saline and were treated as controls. 7 days after treatment animals were sacrificed simultaneously with controls. The liver, vocal sac and the skin from dorsal surface were taken separately from all the animals. Biochemical study of melanin was carried by spectrophotometric method[9]. The tissues were dried in a desiccator and digested with pepsin for 24 h. The melanin granules were separated by centrifugation and then digested with NaOH solution. The melanin concentration in solution was examined by spectrophotometer after filtration.

Results. The melanin pigments were found to be present in the toad skin, liver and vocal sac. The

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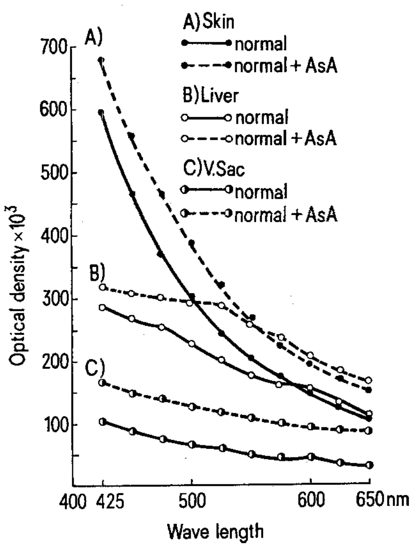
skin showed higher concentration of melanin pigments than the liver and vocal sac. Administration of ASA to normal toads produced an increase in melanin content of skin, liver and vocal sac compared to saline treated controls (Figure).



The effect of ascorbic acid (ASA) on the melanin content of toad skin, liver and vocal sac. Melanin content of A) normal and ASA treated toad skin, B) normal and ASA treated toad liver and C) normal and ASA treated toad vocal sac.

Discussion. The present study demonstrates that ASA causes a considerable increase of melanin pigments in the skin, liver and vocal sac of toads. The possible mechanism responsible for the action of ASA on melanin formation has not been elucidated. ASA in the testis[10] and other tissues (unpublished observation) of toads is known to be oxidized to dehydroascorbic acid. On the other hand dehydroascorbic acid helps in oxidation-reduction of cell by oxidizing the reduced glutathione[11]. It is generally agreed that the enzyme tyrosinase, which is responsible for melanin formation, is inhibited by reduced glutathione[12]. The presence of oxidized glutathione in buffered tyrosine-tyrosinase mixture increases melanin pigmentation[13]. Furthermore, dehydroascorbic acid is known to stimulate steroid hormone synthesis in toad testis[6]. FIGGE and ALLEN[13] have reported that local application of estrogen increases the skin pigments. They have suggested that the enzyme tyrosinase oxidizes ring A of estrone to a quinone which in presence of copper catalyst oxidizes the glutathione.

The possibility remains, therefore, that ASA in its oxidized form (dehydroascorbic acid) stimulates melanin synthesis by oxidizing glutathione either directly or indirectly by increasing sexhormones.

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Heartbeat Reversal and its Coordination with Accessory Pulsatile Organs and Abdominal Movements in Lepidoptera

L. T. WASSERTHAL

Ruhr Universität, Spezielle Zoologie, Buscheystrasse, Postfach 2148, D–463 Bochum-Querenburg (German Federal Republic, BRD), 4 December 1975.

Summary. Haemolymph in certain Lepidoptera at rest is periodically transported from the anterior body to the abdomen and reversed by the coordinated activity of the heart, the accessory pulsatile organs and the abdomen. This oscillatory haemolymph transport is suggested to support haemolymph exchange and air ventilation in the anterior body and wings.

Although heartbeat reversal has been repeatedly described in insects[1–7], it is now generally regarded as being not essential for circulation, but rather a disturbance of heart automatism[6,8] or perhaps a stress reaction[5,9]. In some recent papers, which deal with the electrophysiology of heart rhythm in moths, reversal is either not mentioned[10,11] or is regarded as a rare and irregular event[12]. While mechanisms inducing and controlling heartbeat reversal were the central point of interest[2,5,6,13], little has been elaborated about its function[2,13,14].

Results. A new method, 'contact-thermography'[15] (Figure 1), allows one to examine free, resting insects during their whole lifetime without damage or narcotization, so that periodic heartbeat reversal could be shown to be a regular performance in pharate and adult moths (*Attacus atlas* L., *Argema mittrei* Guér., Saturniidae, Figure 1) and butterflies (*Caligo brasiliensis* Fldr., Brassolidae)[15]. Simultaneous recording of the heart, meso- and metathoracic pulsatile organs (PO's), which are responsible for the adduction of wing haemolymph[11,16]

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