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Hypothermia Due to Localized Lesions in Midbrain of Rabbit.

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These lesions were produced by injections of chromic acid under ether or urethane anesthesia and subsequent gross and microscopic studies made of the brain structures injured. Lesions in one limited area were always followed by a gradual fall in body temperature from a normal of 38° or 39° to 28° or 26° C. within 3 to 5 hours. Injection at any other point so far studied was without marked temperature effect. Accompanying the hypothermia was a gradual decrease in muscular tonus and at 26° C. almost complete atonia. The animal in this condition appears lifeless but if properly cared for can be kept for a number of days.

These results were repeatedly obtained by the injections (some 100) which have been made to date. The microscopic studies are at present in progress.

From the brains already examined it appears that the effective lesion is in the central portion of the superior quadrigemina, 2 to 3 mm. from the aqueduct and within a few millimeters of (but never including) the red nucleus. Since the puncture may be made from a dorsal or lateral direction with the same effect, the superficial midbrain structures are excluded. Within the line of injury are the central gray matter and several nuclei and fiber tracts, notably the nuclei of the third and fourth cranial nerves, portions of the superior cerebellar peduncle, and the posterior longitudinal bundle. It is impossible as yet to say which of these when injured is responsible for the hypothermia or hypotonus resulting, but I feel reasonably sure that some or all of the fibers in the posterior longitudinal bundle are involved in every typical case. This bundle is made up largely of ascending fibers from the vestibular nuclei (probably all 3 nuclei) which are commonly agreed to be necessary for the maintenance of normal tonus. Dysfunction of these nuclei always causes atonia perhaps by removal of an inhibition to the normal myotatic reflex inhibition of the muscle itself. The bundle also includes descending fibers from the interstitial and other less known nuclei of the hypothalamus.

The explanation of the hypothermia which suggests itself is that it is not due to dysfunction of a hypothetical temperature center but that it is an indirect result of the abnormally lowered tonus of all the musculature of the body, an atonia sufficient to decrease appreciably

the heat production. Normal temperature would, therefore, depend on the function of a central neural mechanism, probably the vestibular nuclear apparatus, responsible for normal muscular tonus and for normal heat production.

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Experimental Paratyphoid Intoxication in Man.

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In a number of food poisoning outbreaks competent bacterial examination has failed to reveal the presence of any living microorganisms. It has been inferred especially by Savage and White[1] that many of the outbreaks were due to poisonous thermostabile growth products of *B. aertrycke* or *B. enteritidis*. Animal experimentation along this line has not met with uniform success since most workers have been unable to reproduce symptoms of paratyphoid intoxication by feeding the sterile products of *B. aertrycke* or *B. enteritidis* to animals.

In our experiments 24 people, ranging in ages from 20 to 40 were fed heat killed cultures or filtrates of *B. aertrycke* and *B. enteritidis*. Nine strains were used, 5 of *B. aertrycke* and 4 of *B. enteritidis*. The date of isolation and colony morphology of these strains are as follows:

Strain No.*	Year	Colony Morphology†	Strain No.*	Year	Colony Morphology†
E 520	1888	R, I, S	Ae388	1922	S
Ae522	1892	R	Ae391	1922	S
Ae518	1898	R	Ae411	1923(Apr.)	S
E 396	1921	I, R	E 438	1924(Dec.)	S, I
E 397	1921(Oct.)	I, R			

* Ae prefix refers to *B. aertrycke*. E prefix refers to *B. enteritidis*.
† R=rough, I=intermediate, S=smooth. Arranged in order of predominance.

The cultures were grown in beef heart medium containing 1% of dextrose. They were incubated at 37° C. for periods varying from 2 hours to 20 days. After incubation the supernatant fluid from each culture was divided and half was filtered through a Mandler filter and the remaining half was boiled for 20 minutes. Before feeding both the heat killed cultures and filtrates were tested for sterility. Rabbits were given intravenous injections of the heat

[1] Medical Research Council, Special Report Series, numbers 91 and 92, London, 1925. Published by his Majesty's Stationery Office.