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STUDIES ON SKIN TEMPERATURE IN THERMOREGULATION

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(Summary of Master's thesis written under direction of Dr. K. HONMA)

Skin temperatures from various areas of humans, rabbits, hare, goat, swine and fowls were measured. In the first experiment the skin temperatures were monitored while the room temperature was decreased at a specified time interval from 40° to 5°C and in the second experiment the skin temperatures were measured at constant random room temperatures between 0° and 40°C. The responses of these skin temperatures were categorized into four groups. Group I comprised the skin temperatures from human fingers, ears and forelegs of rabbits, goats and hare, ears and tails of swine, and combs of fowls. Group II comprised the skin temperatures from human toes and hindlegs of rabbits. Group III comprised the skin temperatures from human ears, and toes, wattle and wingtips of fowls. Group IV comprised the skin temperatures from human chests, flanks of rabbits and hare, teats of goat, backs and abdomens of swine. The following results were obtained:

A Experiment I 1) Group I, II and III showed falling of skin temperatures. 2) Group IV showed almost no change in skin temperature as the room temperature fell.

B Experiment II 1) Group I showed an S-shaped curve rising and fluctuating prominently in the mid range of room temperature. 2) The skin temperature of group II paralleled the change in room temperature, but at a slightly higher level. 3) In group III the skin temperature showed a bow-shaped curve fluctuating in the relatively low range of room temperature. 4) The response in group IV was similar to group III, but the changes were not so great. 5) The fluctuations in skin temperature were in some instances much as 14°C in rabbits, 11°C in humans, 17.9°C in goat and 16.9°C in fowls. 6) The greatest skin temperature change in the group I was from 20° to 22°C in humans, from 16° to 23°C in rabbits, and from 15° to 23°C in swine and fowls. An incidental finding of note was when the combs and wattles were removed, the respiratory rate in fowls was increased over normal values suggesting that they may play an important role in temperature regulation.