these 2 intervals[11]. In addition, the present study indicates that the actual NE utilization rate has been significantly decreased by castration.

The finding that a) NE levels for the sham-control group were the same as those previously reported for short term isolation and b) significant differences in levels were seen between the sham-control and castrate groups, are taken to indicate the presence of a sufficient amount of testosterone, in normal animals isolated for 13 months, to maintain normal NE levels in the brain. Nevertheless, the relationship of actual level of testosterone to aggression and NE brain activity awaits further experimentation. The present experiment demonstrates the absence of a compensatory reaction in the brain NE system in response to prolonged lack of testosterone, that is, even 13, months following castration, the noradrenergic system has not reestablished the equilibrium which was altered by the absence of testosterone.

Zusammenfassung. Funktionsdynamik von Gehirn-Norepinephrin (NE) in kastrierten und scheinkastrierten männlichen, geschlechtsreifen (C57Br/6J)-Mäusen wurde nach 13 Monaten Isolierung untersucht. Kastrierung bewirkt starken Abfall des ursprünglichen Niveaus und der Stoffwechselgeschwindigkeit von NE.

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Basal Forebrain Heating and ADH Release in Dogs

There are data indicating that the activity of the hypothalamo-hypophysial antidiuretic system may be increased at high ambient temperatures[1]. A raise of the osmotic pressure of the body fluids, as well as a displacement of the blood within the cardiovascular system producing a decrease of the inhibitory influences from the volume receptors[2,3], have been suggested[1] as the factors responsbile for increase of ADH release under these conditions. The present study was performed on conscious dogs to check whether local heating of the anterior hypothalamic-preoptic (AH/PO) region could also influence ADH release.

Material and methods. Experiments were carried out on 5 mongrel dogs. They were implanted stereotaxically each with 4 thermodes and 2 thermocouples (2 thermodes on each side 6 mm apart with 1 copper-constantan thermocouple bracketed between them) under hexobarbital anaesthesia. The heater of the thermode consisted of a miniature carbon resistor[4] placed at the end of a 0.8 mm stainless steel tube. Inside the tube there was a copper wire insulated except for a tip making contact with the resistor. All thermodes were connected to pins of a plug fastened in a Plexiglas socket which was screwed into the parietal bone and fixed with acrylic cement. A period of two weeks was allowed for recovery. The influence was examined of the heating of some sites in basal forebrain on plasma ADH level, thermoregulatory functions (respiratory rate, rectal and skin temperatures) plasma osmolality and in some cases on urine output. The dogs were fasted for 18 h before the experiment but had free access to water. On the day of the experiment the dog's bladder was catheterized and emptied by air flushing. The polyethylene catheter was introduced into the saphenous vein for blood sampling. Urine output was measured every 10 min. After 30 min from start the AH/PO region was heated for 10 min by connecting the thermode to the battery so that the power delivered was 100 mW. This produced a 0.5 °C rise of the temperature of the brain tissue at a distance of 3 mm from the heater. Blood samples were taken just before the heating, at 10 min in the course and 30 min after termination of the heating. Hypothalamic, rectal and skin temperatures were continuously registered throughout the whole experiment and respiratory rate was continuously registered for a period 5 min before, in the course, and 5 min following the heating. Ambient temperature varied between 20–25 °C.

Plasma ADH level was measured by a modification[5] of the technique described by Czaczkes et al.[6]. Respiratory rate was determined using a resistance transducer placed around the chest. Skin and rectal temperatures were measured by means of the copper constantan thermocouples. After the termination of the experiments the animals were sacrifed, the brains were fixed in formalin, sectioned and stained after Weil.

Results and discussion. A clear cut increase of the plasma ADH level ranging from 6.0 to 58.4 μU/ml was observed during heating of 12 out of 18 examined sites and was accompanied by a decrease of urine output. In all cases the plasma ADH level returned to control values within 30 min after termination of the heating. On the basis of histological examination, it was established that these effects were produced by heating the following areas: the region of the nucleus commissurae anterioris – 4 cases, the lateral preoptic area – 3 cases, the region of the nucleus accumbens septi – 3 cases, the ventrolateral part of the septum – 2 cases. Plasma ADH level did not increase with tips of the thermodes found in: the internal capsule, lateral hypothalamus; fasciculus mamillothalamicus; columna fornicis and dorsomedial part of the hypothalamus. In all but two cases heating of the brain areas which produced an increase of plasma ADH level was accompanied by polypnoe. However, there was no correlation between the intensity of the thermoregulatory responses and ADH release. On the contrary, heating of the two sites, which was accompanied by a particularly high increase of respiratory rate (by 400 and 600%) and a decrease of rectal temperature, produced only a small increase of the plama ADH level. As in each experiment heating of the brain was restricted to an area surrounding a single thermode, it is possible that these strong thermoregulatory responses also produced a lowering of the temperature of the contralateral thermosensitive region

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and ADH release might be simultaneously inhibited by the mechanism described by HAYWARD and BAKER[7]. The skin temperature was rather high under control conditions (32–35 °C) and evident increase of its temperature during heating was seen only in 2 cases. This allows us to assume that there was no greater displacement of blood from deep tissue to the skin and thus ADH release cannot be explained as due to a decrease of the inhibitory influences from volume receptors. Moreover, even in these cases, when strong panting was observed, there was no change of the plasma osmolality. Thus it seems that local heating of middle and rostral parts of the preoptic area and of the ventral septum stimulates some thermosensitive neurones which activate the hypothalamo – hypophysial antidiuretic system. The finding that the effective area for influencing ADH release corresponds to the region in which highly thermosensitive units have been described[8] strongly supports the hypothesis that these neurones influence the regulation of ADH release.

Résumé. On a examiné des effets d'un élèvement local de la température du prosencéphale basal sur le taux de l'ADH plasmatique et les réponses thermorégulatrices chez les chiens chroniquement munis de thermodes. On a constaté en avant de la commissure antérieure une élévation de la concentration de l'ADH dans le plasma sanguin et dans la plupart des cas une polypnée. On peut supposer que les neurones thermosensitifs de la même région jouent un rôle dans l'activation du système antidiurétique hypothalamo-hypophysaire.

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Comparative Studies of Male Genital Structures of Hybrids and Their Parental Species

STURTEVANT[1] was first to show that male genital apparatus offers quite constant and diagnostically valid species differences especially among insects. Since then it has been extensively used in such studies by many workers and in some cases offered a new approach for understanding the mechanism of speciation. The practical importance of these structures has also been now realized by modern systematists (HSU[2]; STALKER[3]; MALOGOLOWKIN[4]; OKADA[5,6]; SPASSKY[7]; TAKADA[8,9]; KANESHIRO[10]; YANG and WHEELER[11]; WHEELER and TAKADA[12]).

Drosophila bipectinata DUDA[13] and *D. malerkotliana* PARSHAD and PAIKA[14] are both sympatric species. Genetic analysis of 3 species, *ananassae, bipectinata* and *malerkotliana* made by NARDA[15,16] has revealed that the latter 2 species are closely related and produce F_1 sterile male and fertile female hybrids. The author wishes to present a comparative account of genital structures of the hybrids and their parental species.

Material and method. Reciprocal crosses between *D. bipectinata* and *D. malerkotliana* were made and the hybrids thus produced were inbred for F_2 progeny and also back crossed with both the parental species. A sufficient number of hybrids from both crosses were utilized for the study of genital structures so as to find out variability within them. Preparations were made from the living organisms as well as after KOH treatment. Diagrams were made with the help of Carl Zeiss Camera-lucida attached to an Olympus microscope.

Observation. Reciprocal crosses (*malerkotliana* ♀× *bipectinata* ♂; *bipectinata* ♀× *malerkotliana* ♂) produced a number of F_1 hybrids of both sexes. The inbreeding test, F_1 ♂×F_1♀, failed to produce offspring while backcrosses in both ways produced offspring.

F_1 (*malerkotliana* ♀× *bipectinata* ♂) females crossed separately to males of both the parental species, produced offspring of both sexes which were more like *bipectinata* and *malerkotliana* respectively. However, some males obtained in *bipectinata* cross showed abdominal tergite coloration, faint but resembling *malerkotliana* male. In second cross, F_1 males crossed separately to both parental species, produced no offspring.

In an alternative back cross F_1 (*bipectinata* ♀× *malerkotliana* ♂) females crossed separately to males of both the parental species, produced offspring of both sexes similar in phenotype to the above cross. In second cross, F_1 males crossed separately to both parental species, produced no offspring.

Thus inbreeding and backcross tests clearly indicate that hybrid females are fertile while males are sterile.

Comparison of phenotype and male genital structures of the parental species and their hybrid. *Drosophila bipectinata.* General body coloration yellow, each abdominal tergite with a dull brown, narrow posterior band. Male prothoracic legs with two obliquely placed sex-combs on metatarsal segment, upper comb with about 5–8 teeth, lower one with 6–9 teeth, 1–2 teeth on distal part of first tarsal segment of same leg (Figure C). Periphallic organs (Figure B): Genital arch elongate, narrowing anteriorly, with about 26–30 bristles along the posterior margin, toe pointed, posterior margin with a process covering a small part of primary clasper. Anal plate triangular. Primary clasper with about 13 marginal bristles, one of them large and directed upward; primary teeth in 2 groups usually 2 and 3. Secondary clasper with a large tooth. Phallic organs (Figure A): Aedeagus bifid, somewhat broadened at middle, pointed and curved apically. Anterior paramere U-shaped. Posterior paramere

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