ovaries excised, weighed and prepared for histological examination. Animals in which hypophysectomy was incomplete were discarded.

Results. 1. *CB 154 and prolactin in intact rats* (Table I). CB 154 by itself had no effect on the oestrous cycle or on ovulation. The observed slight irregularities (extension of oestrus for 1 day and delay of ovulation) in group 2, which was the last one to be treated, were also seen in our stock colony at that time. In groups 5 and 6 oestrus was extended for 1 day in most animals. When killed on the first day of oestrus, the uterus was still distended with fluid as in prooestrus. Prolactin (group 7) induced a state of dioestrus, occasionally interrupted by oestrus.

No differences in the weights of pituitary, adrenal or uterus were observed. The increase in uterine weight in group 6 can probably be accounted for by increased water content due to delayed ovulation.

A dose-dependent increase in ovarian weight and in the number of corpora lutea was found in rats treated with CB 154. 3 mg/kg seems to be a threshold dose: it increased the number of corpora lutea in $^2/_5$ ovaries.

Prolactin, 10 IU/rat/day reversed the effect of CB 154 totally (10 mg/kg) or partially (30 mg/kg).

Corpora lutea in CB 154 treated rats were not, or only slightly enlarged, but failed to undergo normal involution. The luteal cells appeared healthy, but were not functional as judged from the vaginal smear. The age of the corpora lutea could not be determined.

Ovaries from rats receiving CB 154 and prolactin could not be distinguished from those of control animals. In group 7 (prolactin) luteolysis was more marked than in controls. This was particularly evident in the newly formed corpora lutea.

2. *CB 154 and prolactin in hypophysectomized rats* (Table II). The ovarian weight of group II and III, receiving prolactin and prolactin + CB 154 respectively, was about 20 mg less than in group I and IV (controls and CB 154). Prolactin induced a marked luteolysis which could not be overcome by CB 154. CB 154 itself had no effect on ovarian weight or histological appearance of corpora lutea.

Table II. Effect of CB 154 on the luteolysis induced by prolactin in hypophysectomized rats

Group and treatment	*n*	Weight of ovaries (mg/100 g)	*P*
I. Controls	9	53.27 ± 14.17	
II. Prolactin (10 IU/rat/day) s.c.	9	33.72 ± 7.19	< 0.005[a]
III. Prolactin (10 IU/rat/day) s.c. + CB 154 (10 mg/kg/day) orally	10	32.39 ± 7.75	< 0.0025[a]
IV. CB 154 (10 mg/kg/day) orally	8	55.18 ± 6.00	n.s.

[a] No significant difference between groups II and III. *n* = number of animals.

Discussion. The enlargement of ovaries and accumulation of corpora lutea in rats treated with crude ergotoxin, a mixture of ergot alkaloids, was first described in 1944 by FITZHUGH et al.[5]. Ergocornin, a component of ergotoxin (KISCH[6]) and 2-Br-α-Ergokryptine (HEUSON et al.[3]) were reported to have the same effect.

Our results are consistent with those of FITZHUGH and of KISCH, and confirm those of HEUSON. Furthermore we were able to show, that simultaneous administration of prolactin counteracted the effect of CB 154. As CB 154 itself has no luteotropic action (results of experiment 2) this implies that CB 154 interferes with endogenous prolactin. This interference does not occur at the ovarian level, but is mediated by the pituitary. Whether CB 154 acts at the hypothalamic or hypophyseal level cannot yet be concluded, although results of ZEILMAKER and CARLSEN[7] and of PASTEELS[8] point to the pituitary as the site of action.

The present results demonstrate that blocking the secretion of prolactin during the oestrous cycle leads to an accumulation of corpora lutea which fail to undergo normal involution. It is concluded that prolactin is the major luteolytic factor in the cyclic rat.

The dual function of prolactin explains the paradoxical fact, that CB 154 induces involution of corpora lutea in pregnant rats, thereby preventing nidation, while maintaining and accumulating corpora lutea in cyclic rats. Whether prolactin exerts a luteotropic or luteolytic effect depends on the time of administration after corpus luteum formation (MALVEN[9]). Why the newly formed corpora lutea in a cyclic rat respond to prolactin with morphological regression instead of being transformed into a functional state is an intriguing question awaiting further investigation.

Zusammenfassung. Mit Hilfe von 2-Br-α-Ergokryptin (CB 154) konnte bei intakten weiblichen Ratten mit normalem Zyklus gezeigt werden, dass Hemmung der Prolactinsekretion die Lyse der corpora lutea ovulationis verhindert.

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Autoradiographic Localization of Radioactivity in Female Rat Neocortex After Injection of Tritiated Estradiol

During the autoradiographic study of developmental changes in the uptake of radioactivity by the hypothalamo-hypophysial system following a single injection of tritiated estradiol in the female rat (PRESL et al.[1]), an unexpected incorporation of radioactivity into the neocortex has been demonstrated.

Intact female Wistar rats were injected i.p. at the age of 5, 10, 15, 20, 25, 30 and 50 days with estradiol-

6,7-^{3}H (31.7 Ci/mmol = 116 mCi/mg) in a dose of 40 μCi/100 g body weight. Each of the age groups contained 4 rats. 2 h after the injection the animals were killed, the brains fixed for 2 days in formol, and cut in an open-top cryostat. The slides were coated with Kodak AR-10 stripping film, exposed for 13 weeks, and stained in hematoxylin-eosin. The brain of the 5th rat in each of the age groups, which was not given radiochemical, was prepared in the same way to check for the presence of autoradiographic artifacts.

In all age groups, an uptake of radioactivity by a clear-cut demarcated area of neocortex on the lateral surface of cerebral hemisphere on the level corresponding to the horizontal stereotaxic coordinate V 5 and in frontal planes corresponding to AP-0.5-+3.5 in the adult rat according to the stereotaxic atlas of FIFKOVÁ and MARŠALA[2] was found (Figures 1 and 2), without any permanent age-dependent differences. A preferential perinuclear accumulation of reduced silver grains was demonstrated (Figure 3) as is characteristic for the cells in the estrogen target tissues (STUMPF[3]). Labelled cells were dispersed diffusely through the whole thickness of

Fig. 1. Section of the 20-day-old female rat brain in frontal plane corresponding to AP + 0.5 in the adult animal and illustrating the autoradiographic localization of the ^{3}H-labelled area in the neocortex (square). ×18.

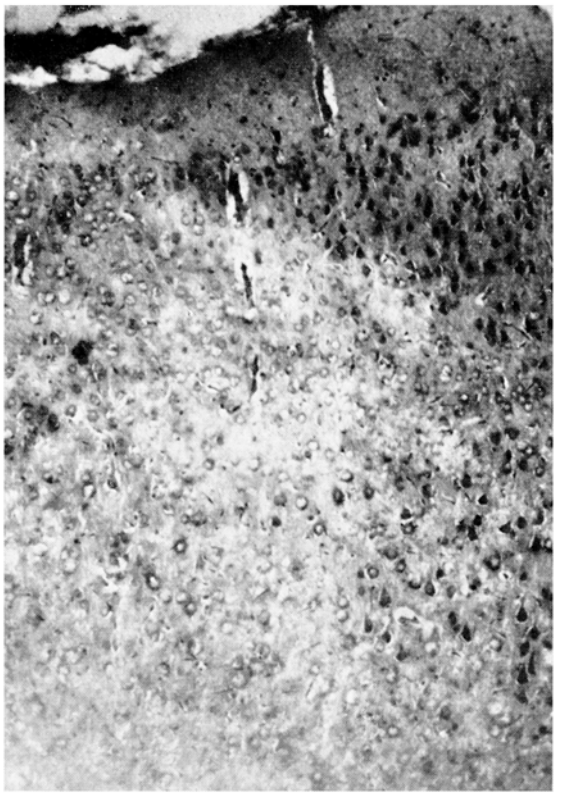

Fig. 2. Boundary of the ^{3}H-labelled neocortical area in the square of Figure 1. ×150.

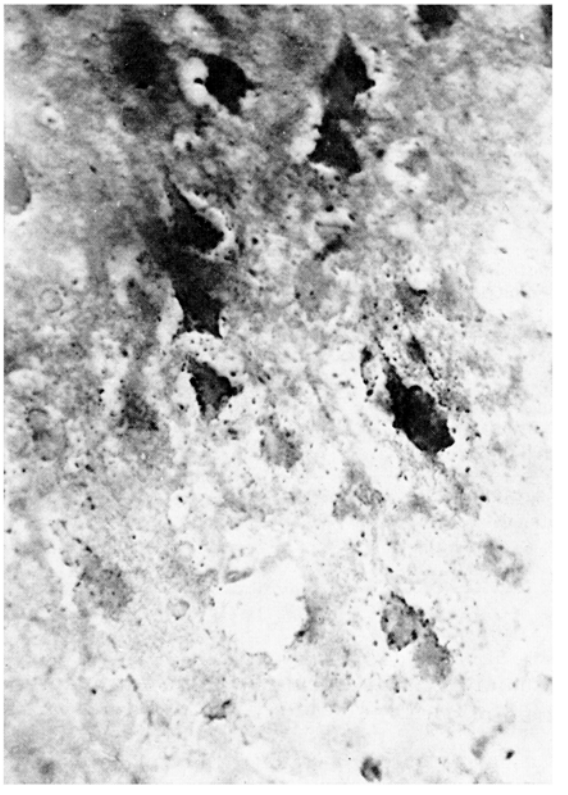

Fig. 3. Perinuclear accumulation of reduced silver grains in the ^{3}H-labelled neocortical area identical with Figure 2. ×1200.

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the neocortex in the circumscribed area. The uptake of radiochemical by some limbic cortical structures was in agreement with the findings of PFAFF[4,5] as far as the olfactory tubercle and piriform cortex are concerned. However, no incorporation into the hippocampal archicortex has been found at one with ANDERSON and GREENWALD[6].

A repeatedly established excitatory action exerted by estrogens in the central nervous system as shown by a decrease in threshold for electrically induced seizures (reviewed by WOODBURY and VERNADAKIS[7]) causes an impression of a rather diffuse effect of estrogens on the cerebral cortex. We speculate about the possible relationship between the demonstrated preferential localization of tritiated estradiol in the neocortex and the efferent cortico-hypothalamic connections.

Zusammenfassung. Durch autoradiographische Untersuchung wurde die Einlagerung von Radioaktivität in ein begrenztes Gebiet des Neocortex der Rattenweibchen nach einmaliger Verabreichung von ^{3}H-Östradiol im Alter von 5 bis 50 Tagen nachgewiesen. Die reduzierten Silberkörner zeigen eine vorwiegend perinukleare Akkumulation, was für die Zellen der Östrogen-Zielgewebe typisch ist.

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Centric Fusion in the Malayan House Rat, *Rattus rattus diardii* (Rodentia, Muridae)

The Malayan house rat is currently recognized as a form of *Rattus rattus* viz. *R. r. diardii* (CHASEN[1], MEDWAY[2], YONG[3]). Its karyotype has been reported by YONG[3] to consist of 11 pairs of acrocentric, 2 pairs of subtelocentric, and 7 pairs of metacentric autosomes, acrocentric *X* and acrocentric *Y* sex chromosomes, with $2n = 42$. The longest autosomal pair has been found to be heteromorphic giving rise to 3 karyotypic classes viz. homozygous acrocentric, homozygous subtelocentric, and heterozygous individuals (YONG and DHALIWAL[4]). A high proportion of the Malayan house rat has also been reported to possess chromosome numbers differing from the normal diploid number of 42 (YONG and DHALIWAL[4], YONG[5]). The present report deals with a case of structural aberration due to Robertsonian-type translocation.

In the course of a population cytogenetic study of the Malayan house rat, a single male was found to possess 41 chromosomes and characterized by an extremely large biarmed (submetacentric) chromosome (Figure 1) which is not present in the normal karyotype (Figure 2).

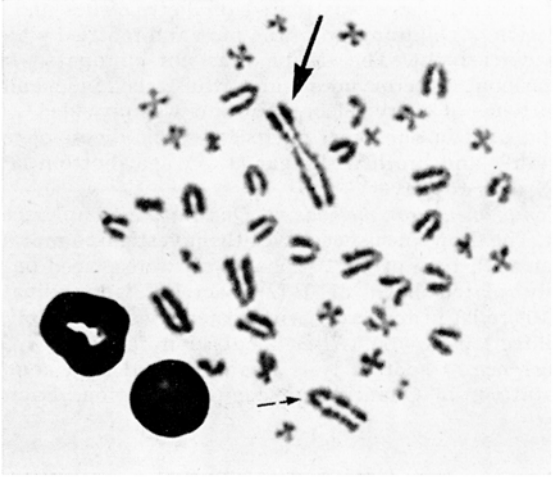

Fig. 1. Metaphase of *Rattus rattus diardii* with 41 chromosomes due to Robertsonian-type translocation. Thick arrow, translocated chromosome; thin, broken arrow, longest autosome.

Detailed karyotype study shows that this biarmed chromosome is most probably the result of centric fusion between the longest autosome and the third longest acrocentric autosome in the complement. There is, however, no means of ascertaining whether the *X* chromosome (the fourth longest acrocentric in the complement, YONG[3]) is involved instead of the third longest autosome.

This case of centric fusion in *Rattus rattus diardii* substantiates 3 earlier reports (BIANCHI et al.[6], CAPANNA et al.[7], YOSIDA et al.[8]) of $2n = 38$ in 3 widely separated populations of *R. rattus* (viz. Italy, South America and Oceania). All 3 populations are characterized by the presence of 2 pairs of large metacentric (one larger than the other), 7 pairs of acrocentric and 2 pairs of subtelocentric (1 larger than the other) autosomes. BIANCHI et al.[6] and YOSIDA et al.[8] reported 7 pairs of small metacentric autosomes, while CAPANNA et al.[7] reported 6 pairs of small metacentric and a pair of small submetacentric. The 2 pairs of large metacentric autosomes were attributed to Robertsonian-type translocation between heterologous chromosomes resulting in the reduction of $2n = 42$ to $2n = 38$. The autosomes involved in centric fusion were medium-sized and small acrocentrics. In all three instances only homozygous animals were reported.

The present observation of a single centric fusion involving the longest autosome and possibly a medium-sized acrocentric autosome is in direct contrast to the $2n = 38$ *Rattus rattus* where the longest autosome is

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