gradually inactive in the receptor males (as in receptor females, see above).

Sham operated and unoperated control males exhibited very faint sexual behaviour which was even less intensive toward control than toward receptor females. The very faint sexual behaviour of the male controls may be explained by supposing that either the controls' own corpora allata are functioning at a sub-normal level during reproductive diapause, or the corpora allata do not completely control male sexual behaviour in *O. miniata* (as is the case in *L. migratoria migratorioides*[4]).

The results show that the corpora allata play a major role in the control of the reproductive diapause in *O. miniata*. This role does not seem to be a trigger mechanism; the continuous presence of the corpus allatum hormone seems to be necessary for continuous egg-laying and for continuous intensive male sexual behaviour. It is not claimed here, however, that the corpora allata are the sole or the primary organs controlling reproductive diapause; other endocrine organs, such as the brain neurosecretory cells may be also involved especially in other species[5].

The corpora allata seem to regulate reproductive and/or adult diapause in the red locust, *Nomadacris septemfasciata*[2] and in the Colorado beetle, *Leptinotarsa decemineata*[6]. Topical application of a synthetic 'juvenile hormone like substance' terminated adult diapause in the alfalfa weevil, *Hypera postica*[7]. However, termination of reproductive diapause induced by implantation of active corpora allata is reported first time in the present paper[8].

Résumé. La greffe de 2 paires de corpora allata provenant de criquets migrateurs mâles adultes (*Locusta migratoria migratorioides*), provoque la rupture de la diapause reproductive chez *Oedipoda miniata* adulte, la ponte chez les femelles et chez les mâles, un comportement sexuel très actif. Chez les témoins non opérés ou ayant subi une opération factice, la diapause reproductive persiste.

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Department of Entomology, The Hebrew University of Jerusalem (Israel), 14 October 1968.

[4] M. P. PENER and E. WAJC, Proc. Int. Symp. Insect Endocr., Brno 1966, in press.
[5] S. GELDIAY, J. Endocr. *37*, 63 (1967).
[6] J. DE WILDE and J. A. DE BOER, J. Insect Physiol. *6*, 152 (1961).
[7] W. S. BOWERS and C. C. BLICKENSTAFF, Science *154*, 1673 (1966).
[8] The support of these investigations provided by a grant (No. 2 b/3 1967–68) from the Anti-Locust Research Centre, London, is gratefully acknowledged.

Effect of Ergocornine on the Luteal 20α-Hydroxysteroid Dehydrogenase in Pseudopregnant and Pregnant Rats

When ergocornine is given to female rats both pregnant and pseudopregnant, the pregnancy or pseudopregnancy is interrupted and ovulation will occur within 72 h[1].

This process is assumed to involve the ovary, the pituitary and, presumably, the hypothalamus.

LINDNER and SHELESNYAK[2] found that ergocornine treatment in pseudopregnancy reduces progesterone (P) and increases 20α-hydroxyprogesterone (20α-HP) content in the ovary, leading to a P/20α-HP ratio of 0.24–0.45 against a 1.9–3.8 ratio found in the untreated animals.

In the ovary the 20α-HP content can be correlated to that of 20α-hydroxysteroid dehydrogenase (20α-HSD)[3].

The presence of this enzyme in the rat ovary can be substantiated histochemically only within the corpora lutea (C.L.)[4]. It appears in the newly formed corpora lutea in the late diestrous[5,6]. The corpora lutea of pregnancy lack this enzyme[7].

Hence, the conclusion can be drawn that ergocornine exerts its effects on pregnancy and pseudopregnancy through the appearance of the 20α-HSD activity in the corpus luteum.

A series of experiments have been performed with the aim of investigating this mechanism of action.

First series: Adult female rats with regular 4–5 days estrus cycle were made pseudopregnant by mating with vasectomized male rats and then divided into groups. Ergocornine was given in aqueous suspension by s.c. injections, 100 μg daily from the first day of pseudopregnancy. The details of the treatment schedule are shown in Table I. The control animals received daily s.c. injections of the vehicle used to prepare the suspension of ergocornine: 0.4% tween 80, 0.5% carboxymethylcellulose, 0.9% benzyl alcohol, 0.9% NaCl, up to 100% distilled water.

Second series: Pregnant female rats were treated daily with 200 μg of ergocornine given by s.c. injection following the schedule in Table II. At sacrifice the ovaries were removed as soon as possible, rapidly frozen with CO_2; cryostatic sections were prepared following the procedure previously described[6]. The sections were processed for the developing of the 3β-hydroxysteroid dehydrogenase (3β-HSD) reaction to identify the C.L. and for the 20α-HSD reactions according to BALOGH[4].

Results. (1) Pseudopregnancy. The results are shown in Table I. The data show that the newly formed C.L. do not display any 20α-HSD activity, at least until the ninth day of pseudopregnancy.

After daily administration of 100 μg of ergocornine the 20α-HSD activity appeared within 2–3 days in all the C.L. of the treated animals.

(2) Pregnancy. The data are summarized in Table II. Ergocornine treatment can cause the onset of the 20α-HSD activity in the pregnancy C.L. after 2–3 daily

[1] W. C. SHELESNYAK, Recent Prog. Horm. Res. *13*, 269 (1957).
[2] H. R. LINDNER and W. C. SHELESNYAK, Acta endocr., Copenh. *56*, 27 (1967).
[3] G. W. WIEST, W. R. KIDWELL and K. BALOGH JR., Endocrinology *82*, 844 (1968).
[4] K. BALOGH JR., J. Histochem. Cytochem. *12*, 670 (1964).
[5] M. PUPKIN, H. BRATT, J. WEISZ, C. W. LLOYD and K. BALOGH JR., Endocrinology *79*, 316 (1966).
[6] E. TUROLLA, U. MAGRINI and M. GAETANI, Experientia *22*, 675 (1966).
[7] E. TUROLLA, G. ARCARI, U. MAGRINI and M. GAETANI, in 2nd Int. Congr. Hormonal Steroids, Milan, Excerpta med. Int. Congr. Series No. 111, 258 (1966).

Table I. Effect of ergocornine on ovarian 20α-HSD in pseudopregnant rats

Group	Days of treatment	Day of sacrifice	No. of animals	Rats with 20α-HSD negative C.L.
1 PP I	1	2	5	5
1 PP II	1–2	3	6	5
1 PP III	1–2–3	4	5	0
1 PP IV	1–2–3–4	5	5	0
3 PP III	3–4–5	6	6	0
5 PP III	5–6–7	8	7	0
Controls	–	5	4	4
Controls	–	9	5	5

Table II. Effect of ergocornine on ovarian 20α-HSD activity in pregnant rats

Group	Days of treatment	Day of sacrifice	No. of animals	Rats with 20α-HSD negative C.L.
1 P I	1	2	6	6
1 P II	1–2	3	5	4
1 P III	1–2–3	4	6	0
6 P III	6–7–8	9	6	1
7 P III	7–8–9	10	6	3
8 P III	8–9–10	11	7	6
9 P III	9–10–11	12	6	6
10 P III	10–11–12	13	6	6

administrations. This effect can be observed in all the animals treated only when the treatment is applied within the fifth day of pregnancy. Treatment initiated on sixth, seventh or eighth day results in correspondingly fewer animals showing this activity. After the eighth day no effect on the enzyme activity can be observed.

Discussion. From the data previously shown it appears that ergocornine treatment causes the onset of 20α-HSD activity both in pseudopregnant and in pregnant C.L. In the pregnant rat this effect is always present only when ergocornine is given within the first 5 days of pregnancy and in fewer cases when given after the fifth but before the eighth day. It is known that, in the rat, implantation takes place only from the fifth day after mating and is complete by the eighth day.

In this period of gestation (first to eighth day), as in pseudopregnancy, the ovary and particularly the luteal 20α-HSD activity is mainly controlled by the pituitary while in the following stages of pregnancy the chorionic secretion plays its considerable role[8–10].

The ergocornine effect on the C.L. in the rat is thus displayed in those situations in which the C.L. itself is mainly under hypophysial control.

When confronting our histochemical results with the findings of LINDNER and SHELESNYAK[2], it is possible to point out that the production of 20α-HP depends on the onset of 20α-HSD activity in the C.L. and to confirm the suggestion that the ergocornine acts on the hypophysial regulation of the C.L.[11].

Riassunto. Trattando ratte gravide o pseudogravide con ergocornina si può osservare la comparsa dell'attività 20α-idrossisteroide-deidrogenasica nei corpi lutei rispettivamente gravidici o pseudogravidici nei quali tale attività normalmente manca. Perchè questo effetto si manifesti sono necessari 2–3 giorni di trattamento. Si constata che l'ergocornina causa la comparsa dell'attività enzimatica sopra indicata in qualsiasi periodo della pseudogravidanza, e nel periodo della gravidanza precedente l'impianto dell'uovo. L'ergocornina quindi agirebbe tramite l'ipofisi dalla cui regolazione dipende l'attività 20α-idrossisteroide-deidrogenasica dell'ovaio.

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13 November 1968.

[8] E. B. ASTWOOD and R. O. GREEP, Proc. Soc. exp. Biol. Med. *38*, 713 (1938).
[9] E. B. ASTWOOD, Endocrinology *28*, 309 (1941).
[10] E. TUROLLA, G. BALDRATTI and E. SCRASCIA, in press.
[11] The authors are indebted to Miss G. E. CACCIA for her most valuable technical assistance.

The Duration of Action of the Synthetic Pentacosapeptide D-Serine[1]-Norleucine[4]-Valinamide[25]-β-1-25-Corticotrophin (DW-75) in Man

A synthetic analogue which has three modifications of the amino acid sequence of naturally occurring corticotrophin, has been synthesized[1]. The polypeptide, D-serine[1]-norleucine[4]-valinamide[25]-β-1-25 corticotrophin, has been named DW-75 (Sandoz). The modifications to the amino acid sequence were introduced with the expectation that they would delay inactivation and degradation of the polypeptide by carboxypeptidases and aminopeptidases.

DOEPFNER[2] found that DW-75 has an activity of 625 IU/mg when assayed by the adrenal ascorbic acid depletion test[3]. The assay value obtained with this compound is six times that obtained with synthetic porcine 1–39 corticotrophin[4] and synthetic 1–24 corticotrophin (Synacthen, CIBA)[5].

In view of the large discrepancy between the weight of DW-75 and the results obtained by biological assay, the present investigation has been undertaken comparing the duration of activity of equal weights of porcine corticotrophin and DW-75 following i.m. injection in normal healthy volunteer subjects. Further studies were carried out following the administration of equal quantities of porcine corticotrophin and DW-75 based on the biological assay. For purpose of comparison, the duration of activity of porcine corticotrophin suspended in gelatine was determined. Further studies on the duration of activity