Table I

The influence of pollen grain extract on the reproductive organs of immature female rats

Treatment	No. of rats	Average body weight	Ovary weight in mg/100 g body weight	Uterus weight in mg/100 g body weight
Control	6	44·00	22·64 ± 0·89*	64·72 ± 7·54
Extract of 10 g pollen	6	43·33	33·93** ± 0·92	82·52 ± 6·72

* Standard error. ** Significantly different at the level of 0·1%.

Table II

The influence of pollen grain extract on the reproductive organs of immature male rats

Treatment	No. of rats	Average body weight	Testes weight in mg/100 g body weight	Seminal vesicle weight in mg/100 g body weight
Control	6	64·00	884·38 ± 29·80*	20·23 ± 0·98
Extract from 10 g pollen	6	63·40	1443·16** ± 30·60	32·87** ± 1·26
Extract from 20 g pollen	5	56·50	475·00** ± 9·55	22·89 ± 0·64

* Standard error. ** Significantly different at the 1% level of probability.

The histological picture of the testes of rats treated with pollen grain extract (10 g) showed a mild activation of spermatogenesis. Spermatozoa were universally distributed in the seminiferous tubules. There was also an increase in tubular diameter and Sertoli cells were well developed. The testes weights of the rats treated with extract from 20 g pollen decreased significantly from those of controls and rats treated with 10 g pollen. This is most probably due to the formation of anti-gonadotrophic hormone.

It is concluded then that date palm pollen grains contain a certain amount of gonadotrophic activity which is predominantly a follicle stimulating type with traces of LH. Further investigations are needed to determine quantitatively the different fractions of this hormone and to identify it by comparing its electrophoretic pattern with that of gonadotrophins of animal origin.

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Résumé

Des grains de pollen de palmier-dattier furent libérés de leur matière grasse à l'ether et séchés à l'acétone. Une hormone gonadotrope en fut extraite à l'eau et précipitée à l'acétone. Administrée à des rats mâles ou femelles n'ayant pas atteints leur maturité, cette hormone extraite de 10 g de pollen (poids d'origine), provoque une augmentation de poids dans les gonades et les organes sexuels accessoires. L'examen histologique atteste aussi une activité spermatogénique et un développement folliculaire. Le principe gonadotropique devra être identifié chimiquement. Il semble avoir la propriété de stimuler les follicules et ne contenir que très peu de traces d'hormones lutéinisantes.

The Influence of Oestrogen and Progesterone on Pituitary Function

Recent studies indicated that the oxygen consumption and thyroid function of female rats undergo cyclic variations associated with the phases of oestrous cycle. Oxygen consumption and thyroid function were at their maxima during the phase of oestrus (SOLIMAN[1], SOLIMAN and REINEKE[2]). It was also found that thyroid and thyrotrophic hormone production is increased during oestrus (SOLIMAN and BADAWI[3]). Thyroid function was also at its maximal during oestrus in rabbits (SOLIMAN and GHANEM[4]) and sheep (GHANEM and SOLIMAN[5]). Oestrogen increases thyroid activity in the presence of the pituitary (SOLIMAN and REINEKE[6]). It is also able to increase the oxygen consumption of rats only if the thyroids are present (SOLIMAN and GHANEM[7]). Recently FELDMAN[8] concluded that the stimulating effect of oestrogen on the thyroid is a direct effect which is not mediated through the pituitary. Further more MERCIER and PAROT[9] suggest that this effect is pharmacological rather than physiological.

Administration of progesterone at a low level reduced the I^{131} uptake by the thyroids (SOLIMAN and REINEKE[6]). It was also noted that such doses of progesterone had a stimulating effect on oxygen consumption in the presence or absence of the thyroid (SOLIMAN and

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Table I

Thyrotrophic, gonadotrophic and ACTH contents of rat's blood as indicated by weight of thyroids, testes and adrenals of 1-day-old male chicks.

Group No.	Treatment	No. of chicks	Thyroid weight	Testes weight	Adrenal weight
			In mg per 100 g body weight		
I	Castrated	5	7·33 ± 0·35*	33·98 ± 7·16	35·88 ± 4·61
II	Castrated + 4 μg oestradiol . . .	8	9·25 ± 0·19	26·05 ± 4·16	36·80 ± 3·36
III	Castrated + 0·4 mg progesterone .	5	8·21 ± 0·17	44·55 ± 2·63	44·14 ± 3·41
IV	Castrated + 4 μg oestradiol + 0·4 mg progesterone	5	8·41 ± 0·76	35·30 ± 4·00	38·14 ± 2·42

* Standard error.

Table II

Thyrotrophic, gonadotrophic and ACTH content of rats' pituitaries as indicated by weights of thyroids, testes and adrenals of 1-day-old male chicks

Group No.	Treatment	No. of chicks	Thyroid weight	Testes weight	Adrenal weight
			In mg per 100 g body weight		
I	Castrated	5	9·36 ± 0·88*	79·55 ± 6·00	28·59 ± 3·79
II	Castrated + 4 μg oestradiol . . .	5	9·16 ± 1·02	64·53 ± 7·12	34·06 ± 3·54
III	Castrated + 0·4 mg progesterone .	5	15·67 ± 1·15	58·57 ± 17·00	45·23 ± 2·60
IV	Castrated + 4 μg oestradiol + 0·4 mg progesterone	5	9·43 ± 0·33	70·34 ± 7·68	35·86 ± 5·31

* Standard error.

GHANEM[7]). In order to clarify the mode of action of these hormones, it was decided to estimate the levels of thyrotrophic, gonadotrophic and adrenocorticotrophic hormone contents of the pituitaries and blood of castrated rats treated with these hormones.

24 male albino rats weighing 150–170 g were used in this experiment. The rats were castrated, then divided into 4 groups containing 6 rats each. To standardize the iodine intake by the animals, they were injected subcutaneously with 5 μg NaI contained in 0·2 ml of distilled water daily. Oestradiol benzoate (B.D.H.) was diluted with sesame oil to contain 2 μg in 0·1 ml. Progesterone (B.D.H.) was also diluted with sesame oil. The injected dose of 0·4 mg progesterone was contained in 0·1 ml of oil. 21 days after castration, the rats in group II were injected with two doses of 2 μg of oestradiol 48 h before autopsy. Group III was injected with 0·4 mg progesterone and killed after 48 h. Group VI was injected with 2 doses of 2 μg of oestradiol, then with 0·4 mg progesterone on the next day, and killed 24 h later. Group I was kept as nontreated control. The animals were killed by decapitation under light ether anaesthesia, their blood collected and serum separated by centrifuging at 3000 rpm for 15 min. The pituitaries were dissected and weighed with a torsion balance. The thyrotrophic, gonadotrophic and ACTH contents were determined by the use of 1-day-old chicks (SMELSER[10], EVANS *et al.*[11], and BATES *et al.*[12]). Groups of chicks corresponding to each of the rats were given daily doses of either 0·1 mg pituitary contained in 0·1 ml saline, or 0·3 ml of serum for 4 days. The chicks were then killed with ether on the fifth day. The average thyroid, testes and adrenal weights of the male chicks were used as criteria of the levels of thyrotrophic, gonadotrophic and ACTH of the blood and pituitaries. The data were analysed statistically using the '*t*' test for testing the differences between the averages.

The accompanying tables, together with the statistical significance, show that the thyroids of the chicks treated with serum of rats given oestrogen alone, were heavier than those given sera obtained from other groups. It also appears that the thyrotrophic hormone content of the pituitaries of rats treated with progesterone was greater than that of the other groups. The level of gonadotrophic hormone in the blood of oestrogen treated rats was significantly lower than that of any of the other groups. The level of gonadotrophic hormone in the blood of progesterone treated rats was higher than that of the other groups. The ACTH content of the pituitaries of rats treated with progesterone as reflected on the chick adrenal weights was greater than that of the other groups.

It is concluded from these findings that oestrogen increases the rate of outpouring of thyrotrophic hormone into the blood stream, and this subsequently stimulates thyroid function. Progesterone seems to interfere with the release of thyrotrophic hormone resulting in the accumulation of this hormone in the pituitary. It appears also that oestrogen interferes with the synthesis and release of gonadotrophic hormone, while progesterone enhances the release of this hormone into the blood. The small dose of oestrogen used did not influence the formation or release of ACTH. Progesterone on the other hand interferes with its release from the pituitaries.

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Résumé

24 rats mâles castrés furent divisés en 4 groupes de 6. Ils furent traités à des doses physiologiques de benzoate d'œstradiol, de progestérone ou d'une combinaison des deux hormones. On constata que l'administration d'œstrogène augmente la concentration de l'hormone thyréotrope dans le sang des rats, tandis que la concentration de l'hormone gonadotrope en est diminuée. D'autre part l'administration de 0,4 mg de progestérone augmente la concentration des hormones gonadotropes et adrénocorticotropes dans le sang des rats. Le progestérone augmente aussi la quantité d'hormone thyréotrope dans l'hypophyse.

Wirkung des Neurotoxins *Shigella Shigae* auf die Krampfbereitschaft

Es wird der Einfluss des Neurotoxins der *Shigella Shigae* auf experimentelle Krampfanfälle geprüft. Während Dysenterieerkrankungen sind bei Kindern in der Klinik des öfteren Krampfanfälle zu beobachten[1].

Laboratoriumsmäuse erhielten intraperitoneal 0,4 ml dieses Neurotoxins auf 20 g Körpergewicht. Die Verdünnung war 1:100. Bei dieser Dosis wurden in 3 Tagen 20% der Versuchstiere getötet. Von den überlebenden Mäusen zeigten nur einzelne Zeichen einer Intoxikation (Diarrhöe, Benommenheit, Paresen der Extremitäten). 72 h später wurde die Krampfbereitschaft geprüft und zwar mit der Methode der Kardiazol-, Elektroschock- und reflektorischen audiogenen Krämpfe.

Krampfart	Anzahl der Versuchstiere	Davon Krämpfe %	Anzahl der Kontrolltiere	Davon Krämpfe %	Statistische Signifikanz *P*
Kardiazol (60 mg/kg intraperitoneal) . .	30	46,6	30	16,6	0,02
Elektroschockkrämpfe	49	83,7	49	53,1	0,001
Audiogene Krämpfe	26	61,5	26	23,1	0,01

Wie die Tabelle zeigt, war die Krampfbereitschaft bei allen verwendeten epileptogenen Reizen erhöht. Diese Erhöhung ist statistisch gesichert.

Dieses Ergebnis bestätigt den in der Klinik gewonnenen Verdacht, dass Shigellatoxin krampffördernd wirkt.

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Summary

The neurotoxin *Shigella Shigae* increases the readiness for cardiazol, electroshock and reflectory audiogenic cramps.

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Integrative Pattern of Reflex Actions by Impulses in Large Muscle Spindle Afferents on Motoneurones to Hip Muscles

Motoneurones are influenced by nerve impulses from various kinds of muscle receptors[1]. For example a slight stretch will cause a discharge in the large afferents (Ia fibres) from the muscle spindles. These impulses produce excitatory post-synaptic potentials (EPSP's) in the motoneurones on which they impinge monosynaptically and may thereby give rise to a reflex discharge of impulses.

The connexions which afferent Ia fibres make with different motor nuclei have been studied in detail on muscles operating at the knee and ankle joints by recording reflex discharges[2] and more recently by recording intracellularly the potential change occurring in individual motor nerve cells[3]. The excitatory action by Ia fibres coming from any particular muscle has been found to extend to motoneurones which subserve this muscle and to others which operate synergically at the same joint. One exception to this rule has been observed, namely the ankle extensor, soleus, which can be activated by Ia impulses from the knee extensor vasto-crureus[3].

Impulses in Ia fibres are known to exert inhibitory action on motoneurones of antagonist muscles evoking in them potential changes of opposite sign (so called inhibitory post-synaptic potentials, IPSP's). With knee and ankle muscles these inhibitory effects are strictly limited to the antagonists[4].

The present investigation has been concerned with the synaptic actions of Ia impulses onto motoneurones of hip flexors (iliopsoas and sartorius) and hip extensors (semimembranosus and adductor femoris). In Figure 1 intracellular records are shown from a typical iliopsoas motoneurone. The EPSP contributed by the nerve from iliopsoas itself (*A*) was of about the same size as that produced by an afferent volley from the synergist hip flexor, sartorius (*B*). In records *C–E* IPSP's are shown evoked as expected by afferent volleys from the antagonist hip extensors: adductor femoris (*C*), semimembranosus (*D*), and anterior biceps (*E*). In *F*, however, it is shown that a volley from the knee extensor, vasto-crureus, also contributed a similar IPSP. In other experiments in which it was possible to distinguish between fast and slow components (Ia and Ib) of the afferent group I volley[5], it has been ascertained that the IPSP's evoked by vasto-crureus volleys in hip flexor motoneurones are indeed produced by the Ia type afferents. This inhibitory action therefore represents an exception to the usual pattern of reciprocal innervation, and moreover, the inhibitory action contributed by the knee-extensor was larger than that coming from any single hip-extensor muscle.

Motoneurones of hip extensor muscles were found to receive excitatory effects from Ia afferents of other muscles than their synergists. Figure 2 shows EPSP's produced in a semimembranosus motoneurone by affe-

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