be noticed in Table 2 that as long as the *lem* gene is present in homozygous, the enzyme activity is very low. However, the lack of xanthopterin-B does not necessarily indicate the presence of the enzyme, since, for instance, in the mutants "Striped" marking (p^s) and "od-translucent" (*od*), these genes have also an effect of suppressing the accumulation of xanthopterin-B[1].

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Résumé

Nous avons démontré qualitativement chez le *Bombyx mori*, l'existence d'un ferment qui attaque la xanthoptérine-B, une substance fluorescente du type ptérinique qui se trouve dans les intéguments des larves de race jaune «lemon», et se transforme en une substance non-fluorescente. Le ferment se trouve dans les épidermes, tissus adipeux des larves et dans les œufs et cocons des *Bombyx* de type normal. Chez les mutants de la race jaune, l'activité du ferment est faible ou nulle dans bien des tissus. Cependant on ne peut pas nécessairement dire que la présence de ce ferment conduit à l'absence de la xanthoptérine-B, parce que l'accumulation de xanthoptérine-B est supprimée par l'action d'autres gènes chez les mutants «Striped marking» (p^s) ou «od-translucent» (*od*). Dans ces derniers l'activité du ferment est en effet très faible.

[1] H. ARUGA, N. YOSHITAKE, and S. ISHIKAWA, J. Sericult. Sci. Japan *20*, 399 (1951).

Concerning the Biogenesis of Lysergic Acid

Recently VAN TAMELEN[1] has proposed a biogenetic route to lysergic acid (VI, $R = CH_3$) having its origin in the coupling of a dihydronicotinic acid (or derivative) with a quinone imine derived from 5-hydroxytryptophan.

[1] E. E. VAN TAMELEN, Experi. *9*, 457 (1953).

The present writer would like to suggest the relatively simple and direct biogenetic pathway to lysergic acid involving the condensation of tryptophan (I) with citric acid (III).

The transformation of IV → V by dehydration with accompanying loss of carbon dioxide is based on extensive precedent, e.g., the conversion of citric to itaconic acid[1] and the formation of desmethylaxerophthene in the synthesis of vitamin A acid[2].

N. L. WENDLER

Merck & Co., Inc., Rahway, N.J., February 13, 1954.

Zusammenfassung

Ein biogenetischer Weg zur Lysergsäure, bestehend in der Kondensation von Tryptophan mit Zitronensäure, wird vorgeschlagen.

[1] R. ANSCHÜTZ, Ber. dtsch. chem. Ges. *13*, 1542 (1880).
[2] N. L. WENDLER, H. L. SLATES, N. R. TRENNER and M. TISHLER, J. Amer. chem. Soc. *73*, 719 (1951).

Oestrus Activity in Fat-Tailed Sheep During the Longest Days

The importance of day-length as a controlling environmental factor has been shown in poultry[1], old-world birds[2], and in a variety of mammals. Farm animals could be classified in this respect into three classes, those which are short-day breeders, such as sheep[3] and goats[4]; those which are long-day breeders, such as poultry, including pheasants[5]; and those which are not particularly responsive to daylight environment, such as rabbits. The conventional view of photoreception is that light received by the eye starts an unknown

[1] E. O. Whetham, J. Agric. Sci. *23*, 383 (1933).
[2] J. R. BAKER, Tabul. Biol. Berl. *15*, 333 (1938).
[3] E. S. E. HAFEZ, J. Agric. Sci. *42*, 189 (1952).
[4] T. H. BISONNETTE, Physiol. Zool. *14*, 379 (1941).
[5] T. H. BISSONNETTE and A. G. CZECH, J. Wildlife Management *5*, 383 (1941).

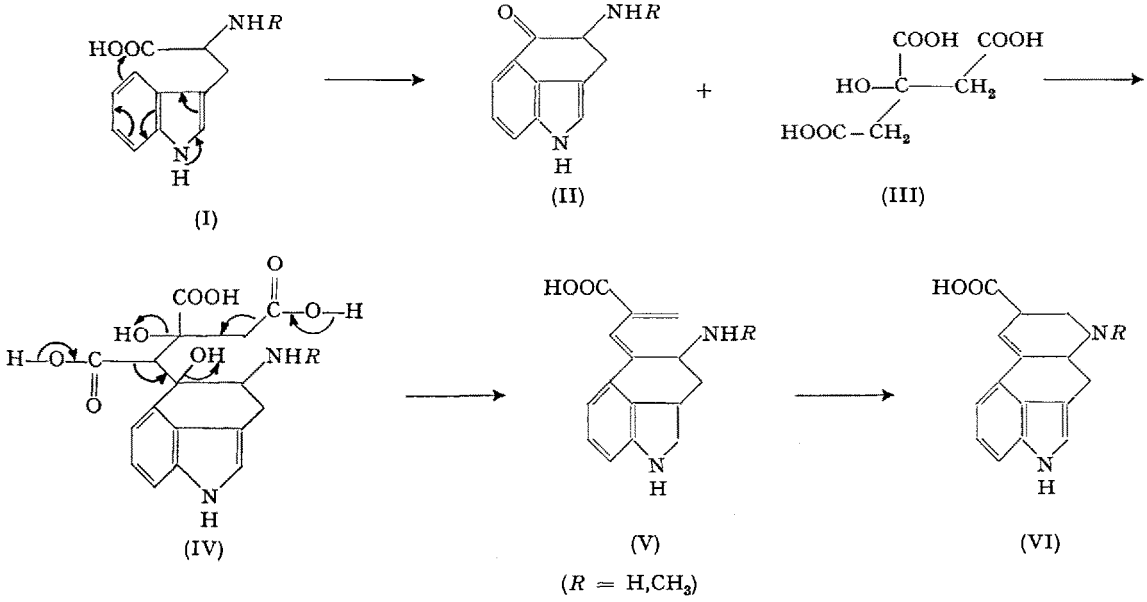

Table I.–Breeds of sheep showing oestrus during the longest days (June in N. hemisphere and December in S. hemisphere).

Breed	Locality	Latitude	Authority
Bikaneri	Punjab, India	30° N.	SMITH and HUSSEIN[1]
Blackhead Persian	South Africa	20–35° S.	LABUSCAGNE[2]
Blackhead Persian	Trinidad	11° N.	METURER[3]
Fine woolled	Madras, India	11° N.	KHOT and RAMCHANDRAN[4]
Indian (grade)	Los Banos, Philippines	5–18° N.	VILLEGAS[5]
Karakul	Turkestan, U.S.S.R.	40° N.	FROLICH[6]
Mandya	Maysore, South India	12° N.	RAO[7]
Merino	McMaster Field, Australia	34° S.	KELLEY and SHAW[8]
Merino	Kenya, Africa	Equator	ANDERSON[9]
Merino	Cape Karoo, South Africa	25–35° S.	QUINLAN and MARE[10]
Persian Blackface	British Guiana, South America	5° N.	KADGIEN[11]
Ronderib	Ermelo, South Africa	26° S.	ROUX[12]

[1] L. W. SMITH, M. HUSSEIN, Agric. Live-Stk. India *8*, 126 (1935).
[2] F. J. LABUSCAGNE, Fmg. S. Africa *23*, 77 (1948).
[3] D. METURER, Personal communication (1953).
[4] S. S. KHOT and K. N. RAMCHANDRAN, Indian Fmg. *9*, 63 (1948).
[5] V. VILLEGAS, Philippine Agric. *17*, 477 (1928).
[6] G. FROLICH, *Das Karakulschaf und seine Zucht* (Munich, 1931).
[7] M. V. K. RAO, Indian Vet. J. *21*, 414 (1945).
[8] R. B. KELLEY and H. E. B. SHAW, Bull. Coun. Sci. Industr. Res. Aust. No. *166* (1943).
[9] J. ANDERSON, Personal communication (1952).
[10] J. QUINLAN and G. MARE', *17th* Rep. Dir. Vet. Ser. Anim. Ind. S. Afr. *1931*, 663.
[11] G. KADGIEN, Dtsch. landw. Tierz. *38*, 393 (1934).
[12] L. L. ROUX, Onderstepoort J. Vet. Sci. *6*, 465 (1936).

sequence of events terminating in the stimulation of the adenohypophysis which in turn regulates the reproductive phenomena. HARRIS[1] has suggested that one link in the chain of events between the light stimulus and gonadal reaction may be affected by the hypophyseal portal vessels, and that the nervous system regulates the activity of the adenohypophysis by means of a humoral relay through these vessels.

The length of the sexual (breeding) season is related to the geographical origin (latitude and altitude) of the breed (HAFEZ[2]). In England, the sexual season of Suffolks is fairly evenly spaced about the shortest days when the day-length is 11·5 h or less (HAMMOND Jr.[3]). The breeds which manifest oestrus throughout the year, even during the longest days are located at low latitudes extending from 35° N to 35° S (Table I).

The present experiment was an attempt to investigate the frequency of oestrus activity of Egyptian fat-tailed sheep during the longest days in Cairo (30° N).

Materials and Methods. One hundred and nine Egyptian fat-tailed ewes (Ossimi and Rahmani breeds) and six rams were available at the *Animal Breeding Research Farm, Cairo, Egypt.* The animals were joined with ochred aproned rams during May (longest days of the year). During June and July, the Ossimi ewes were joined with ochred fertile rams. Oestrus and mating were observed twice daily.

Results and Discussion. The ewes experienced oestrus after a period ranging from 1 to 79 days. The maximum number of ewes exhibiting oestrus was on the 3rd and 4th week from the date of joining the rams (Table II). From the 6th to the 12th week, only 5% of all the oestrus ewes came on heat. There was no significant difference between the two breeds in the rate of coming into oestrus. They required from one to three services with an average of 1·2 services.

Certain ewes, after showing oestrus, experienced silent heats (ovulation without oestrus). In 6 Ossimi ewes and 8 Rhamani ewes, one silent heat was recorded, the length of the oestrous cycle ranged from 26 to 36 days. In one Ossimi ewe and one Rahmani, two successive silent heats were recorded, the cycle length was some 37 days. 14% of the Ossimi ewes and 13% of the Rahmani ewes were anoestrous during the months of observations (May, June, and July).

Table II.–Sexual performance in fat-tailed ewes during the longest days (May to July) in Cairo (30° N.).

	Actual		% of total	
Breed	O.	R.	O.	R.
Total No. of ewes	63	46	100	100
On heat on 1st weak	13	6	21	13
On heat on 2nd weak	8	3	13	7
On heat on 3rd weak	17	13	27	28
On heat on 4th weak	10	12	16	26
On heat on 5th weak	4	3	7	7
On heat on 6th weak	2	1	3	2
On heat on 7th weak	0	0	0	0
On heat on 8th weak	0	0	0	0
On heat on 9th weak	0	0	0	0
On heat on 10th weak	0	0	0	0
On heat on 11th weak	0	0	0	1
On heat on 12th weak	0	0	0	2
Anoestrus for 12 weeks	9	6	14	13

O. = Ossimi R. = Rahmani

The two breeds of fat-tailed sheep experience oestrus during the longest days. This shows that they do not show a limited breeding season at this latitude. This view is confirmed by the results of MOUNIB[1] who used the Rahmani breed (the same breed used in this experiment) reared in Alexandria. This is mainly due to the

[1] G. W. HARRIS, Physiol. Rev. *28*, 139 (1948).
[2] E. S. E. HAFEZ, Nature *167*, 777 (1951).
[3] J. HAMMOND Jun., J. Agric. Sci. *34*, 97 (1944).

[1] M. MOUNIB, personal communication (1953).

small fluctuation in day-length in this subtropical zone. However, it seems that there is some sort of fluctuation in the percentage of the ewes showing oestrus throughout the year. Such phenomenon may be attributed to other environmental factors, such as the atmospheric temperature, feeding conditions and management. It is well established that oestrus activity is controlled by the gonadotrophic hormones secreted by the adenohypophysis. The pituitary activity undergoes seasonal changes during the breeding season as shown by histological evidence (WARBRITTON and MCKENZIE[1]).

Silent heat is manifested in certain individuals and not in others. There is a possible correlation between the frequency of silent heats and the number of services per conception. HAFEZ[2] has shown that silent heat occurs more frequently in mountain breeds than in other breeds and in ewe lambs more than in adults. PARKES and HAMMOND[3] have suggested that silent heat is associated with temporary insufficiency of gonadotrophic and follicular hormones. In cattle, the lowest incidence of silent heat is associated with the excess of sunshine and daylight which normally occurs in May (HOELZER[4]).

It is therefore recommended that culling ewes according to oestrous performance should be carried out during the longest days, the critical period for manifestation of oestrus. It is concluded that fat-tailed sheep experience oestrus activity during the longest days in the subtropical zone. A small percentage, however, remains anoestrous, probably due to severe climatic conditions. Meanwhile, the season of the oestrus activity does not necessarily coincide with the season of oögenesis, the former being shorter than the latter.

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Faculty of Agriculture, University of Cairo, December 17, 1953.

Zusammenfassung

Ägyptische Schafe zeigten Zeichen von Brunst während der längsten Tage des Jahres (Mai bis Juli) in Kairo. Ein kleiner Prozentsatz zeigte keine Anzeichen von Brunst, wahrscheinlich infolge der schwierigen klimatischen Bedingungen. Eine Schwangerschaft trat nach 1–3maligem Decken ein. Andere Rassen, welche Brunsterscheinungen während der längsten Tage in verschiedenen Teilen der Welt zeigen, sind in Tabelle I zusammengefasst.

[1] V. WARBRITTON and F. F. MCKENZIE, Res. Bull. Mo. Agric. Exp. Sta. no. *257*.

[2] E. S. E. HAFEZ, J. Agric. Sci. *42*, 189 (1952).

[3] A. S. PARKES and J. HAMMOND, Proc. Roy. Soc. Med. *33*, 483 (1940).

[4] H. HOELZER, Dtsch. tierärztl. Wschr. *55*, 136 (1948).

The Use of F.S.H. Gonadotrophins to Obtain Functioning Ovarian Grafts in the Anterior Chamber of the Eye

It is well known that the transplant of female gonads on the iris tissue of the anterior chamber gives generally positive results. The active growth of the homologous transplantation is obviously good, but autologous transplantation is, of course, better. In every case the grafts, investigated in a number of females treated with pregnant woman's urine, did not give evidence of follicular hæmorrhagic reaction. Infact the functional reactivity to the hormonal action of the gonad still *in situ* and that of the gonad transplanted in anterior chamber, differ widely: in the former the reaction was evaluated to be 300 times greater than in the latter.

Fig. 1.—Microphotograph of mature ovary of rabbit, *in situ*.

From my investigations it appears that reactivity is also very slight when total ovariectomy is performed on the animal before the gonad is grafted in the anterior chamber, although some authors have reported positive results (ALLEN and PREIST; PODLESCKA and DWORZAK; GOODMAN; MAY[1]).

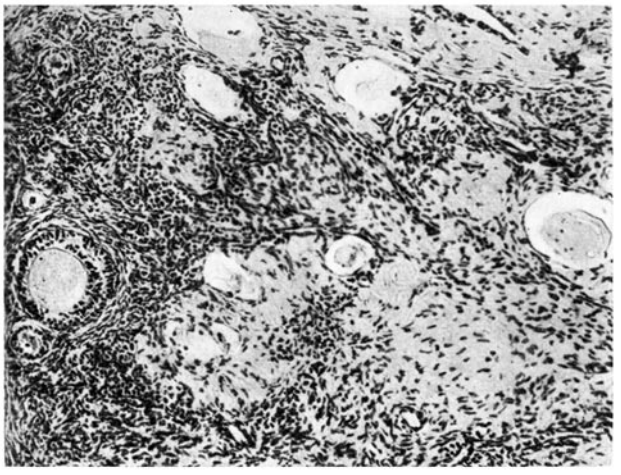

Fig. 2.—Microphotograph of mature ovary of rabbit after residence in anterior chambre for 20 days. The animal received small doses of F.S.H.

It is interesting that animals treated with small amounts of F. S. H. gonado-trophins (25 I.U. daily administred intramuscularly, in the first 8 days following the ovarian graft in the anterior chamber) show a highly increased rate of successful transplantations, as well as a better active grow of grafts. Now, fifteen days after the end of the treatment mentioned, the functional

[1] E. ALLEN and F. O. PREIST, Surg. Gyn. Obst. *55*, 533 (1932). – L. GOODMAN, Anat. Record *59*, 223 (1934). – R. N. MAY, C. r. Soc. Biol. *138*, 775 (1944). – L. PODLESCKA and H. DOWRZAK, Med. Klin. *30*, 438 (1934).