

different percentages of cells in large and small embryos having been capable of division at any given time in the course of development. Such an effect may be produced at any time during the growing period of the animals by many different sets of conditions, for example, by differences in food supply. Castle and Gregory,^{1,5} and Gregory and Castle⁶ maintain that there is an inherent difference in rate of cell division between their large- and small-race rabbits. Such a difference must be present throughout the period of growth of the normal animals.

Gregory and Castle have collected conclusive evidence that large-race-rabbit embryos have more cells than small-race embryos at the 40- and 41-hour stages. However, their data for hybrid embryos between the two races does not rule out the possibility that the difference in cell number at those stages is due to some factor in the environment of the embryo or in the previous history of the egg. Hybrid embryos from a large male and small female mating had significantly fewer cells at 41 hours than large-race embryos of the same age. The difference in average cell number was 2.39 ± 0.568 , 4.2 times its probable error. The difference between small-race embryos and those of the hybrids was only 0.62 ± 0.592 . This is not a significant difference since it is only slightly greater than its probable error. Therefore, whatever factor inhibited or delayed cell division in the small-race embryos may also have operated on the hybrid embryos from small females and need not have been inherent in the embryos.

In summary, Byerly² offered the more probable interpretation of his data. This has been supported by the results of subsequent investigations. Gregory and Castle⁶ have not yet precluded the possibility of other interpretations of their own data.

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OESTRUS-PRODUCING HORMONES

RECENTLY Doisy and his coworkers¹ have reported the isolation from the urine of pregnancy of a crystalline substance possessing oestrus-producing activity, which is distinct from the active substance theelin previously described by them. The latter substance to which they gave the formula $C_{18}H_{21}(OH)_2$ was shortly afterwards isolated by one of us^{2,3} and by Dingemans and coworkers.⁴ It was shown subse-

quently⁵ that this substance is represented by the formula $C_{18}H_{22}O_2$ and that it behaves either as a hydroxy ketone or as a dihydroxy alcohol.

There is no doubt that the second substance isolated by Doisy and his coworkers to which they give the formula $C_{18}H_{21}(OH)_3$ is identical with that fully described earlier by one of us.^{6,7} Although Professor Doisy refers to the triol previously isolated, there is no suggestion in his papers that it had also been characterized as a trihydroxy substance of the formula $C_{18}H_{21}(OH)_3$. His view that the substance described by one of us is a mixture of both active substances is apparently based solely on a difference between the uncorrected melting points. The evidence of the analytical data, which clearly shows this supposition to be untenable, is ignored.

A year ago when the presence in urine of two distinct oestrus-producing substances was clear to us, we were considerably puzzled over the relationship between them. The suggestion was tentatively advanced⁷ that the substance $C_{18}H_{22}O_2$, on treatment with hot alkali, took up the elements of water to form $C_{18}H_{24}O_3$. This supposition was subsequently shown to be incorrect,⁸ since the former substance proved to be unchanged by such treatment. At the same time it was shown that both substances occur together in urine, and that by distillation in a high vacuum with potassium bisulphate, $C_{18}H_{24}O_3$ could be converted into $C_{18}H_{22}O_2$. Professor Doisy has made no adequate reference to this work and has advanced the earlier view which has been shown to be untenable.

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AN ADDITION TO THE HERPETOLOGICAL FAUNA OF KANSAS

A SINGLE specimen of *Bufo punctatus* Baird and Girard was secured in the vicinity of Elkhart, Morton County, Kansas, by W. H. Burt and a party of students from the Museum of Birds and Mammals, University of Kansas, between June 25 and July 5, 1927.

I believe this to be the first record of this species in Kansas. The systematic papers on Kansas herpetology, including the recent "List of Reptiles and Batrachians of Morton County, Kansas,"¹ make no mention of it.

⁵ *Jour. Morph. and Physiol.*, 48, Sept., 1929.

⁶ *Jour. Exp. Zool.*, 59, April, 1931.

¹ Doisy *et al.*, *Proc. Soc. Exp. Biol. Med.*, 28, 88, 1930; *J. Biol. Chem.*, 91: 641, 647, 653, 655, 1931.

² A. Butenandt, *Naturwiss.*, 17: 879, 1929.

³ A. Butenandt, *Deutsch. Med. Woch.*, 55: 2,171, 1929.

⁴ Dingemans *et al.*, *Deutsch. Med. Woch.*, 56, 301, 1930.

⁵ A. Butenandt, *Zeit. f. physiol. Chem.*, 191: 140, 1930.

⁶ G. F. Marrian, *Chem. and Ind.*, June 20, 1930.

⁷ G. F. Marrian, *Biochem. J.*, 24, 1,021, 1930.

⁸ A. Butenandt, *Abh. d. Ges. d. Wissensch. zu Göttingen; Math. phys. Kl. III Folge*, Heft 2, 1931.

¹ E. H. Taylor, *Univ. Kansas Sci. Bull.*, XIX, 6: 63-65, 1929.

Published records of the range of *Bufo punctatus* report it from western Texas to southern California and Lower California.² It has also been reported from Utah³ and extreme southwestern Colorado.⁴ Ortenburger⁵ reports a single specimen from Comanche County, Oklahoma, which seems to have been the northernmost record east of the Continental Divide. So it would appear that the known range of *Bufo punctatus* east of the Rocky Mountains has been extended about a hundred miles to the north.

Bufo debilis, a near relative, has been recently discovered in the same locality,⁶ which makes the occurrence of this species less extraordinary than it would have been otherwise.

The measurements of the Kansas specimen (*Kansas Univ. Mus. Nat. Hist.*, No. 9100) are given below. They are quite average for specimens of *punctatus* from Texas and New Mexico.

Total length	51 mm
Length of head	11 mm
Width of head	21 mm
Length of hind leg	40 mm
Length of foot	30 mm
Least interorbital width	7 mm
Width of parotoid gland	6.5 mm
Length of parotoid gland	5.5 mm

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DO PEANUT OR ARACHIS NUT FED HOGS YIELD LARDS CONTAINING ARACHIDIC ACID

SOLTSIEN¹ states that lard from hogs fed on cottonseed meal gives a reaction for cottonseed oil as if 25 per cent. of it were present; the milk of cows fed on cottonseed also gives the reaction for the oil.² In a similar way Sesame oil transmits its familiar color reactions to lard and butter.³

In as much as the compounds producing the reactions passed unchanged through the animal economy, the question arose as to whether the characteristic glyceryl arachidate of peanut oil would show in lard made from hogs fed on peanuts.

² L. Stejneger and T. Barbour, "Check List of North American Amphibians and Reptiles," *Harvard Press*, 1923.

³ V. M. Tanner, *Copeia* 166: 25, 1928.

⁴ M. M. Ellis and J. Henderson, *Univ. Colorado Studies*, 1915.

⁵ A. I. Ortenburger, *Proc. Oklahoma Acad. Sci.*, 6: 92, 1926.

⁶ E. H. Taylor, *loc. cit.*

¹ *Z. öffentl.*, Ch. I, 140, 1901.

² J. Wauters, *Soc. Chem. Ind.*, 19, 172, 1900.

³ König and Z. Schluckebier, *Unt. Nahr. u. Genussm.*, 15, 642, 1908, and also Engel, *Z. ang. Chem.*, 268, 1906.

Five hundred grams of lard, obtained from a famous Virginia producer of hams made from peanut-fed hogs, were saponified and treated to obtain arachidic acid by the well-known method of Renaud modified by Tolman.⁴ The resulting fatty acids were changed to their methyl esters and distilled *in vacuo*. Two fractions were obtained, one on recrystallization gave an acid which melted at 61° corresponding to palmitic acid, and another an acid melting at 67°-69° indicating stearic acid. No trace of a high boiling methyl arachidate was found.

As to the reason for the different behavior of these oils, the color-giving compound in cottonseed oil is thought to be of aldehydic nature, while that in Sesame oil may be phenolic, both of low molecular weight, as compared with glyceryl arachidate (974).

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A MOTOR FOUND IN NATURE

SOME time ago, while sitting on the shore of a small lake, my attention was drawn to an object squirming in the water. A slender floating reed was turning over and over. My curiosity led me to withdraw the reed and to examine it carefully.

Apparently the reed had not grown straight but had assumed somewhat a cork-screw shape. It was quite accidental that, at the time I happened on the scene, one wave-length of the waves then running closely approximated the axial distance covered by one revolution of the screw-shaped reed. Since the latter was lightly held by obstructions so that it was forced to remain normal to the advancing wave-fronts, each wave, as it moved shorewards, gave the reed one complete revolution.

Here was a tiny motor. I decided to construct a larger one on the plan taught me by the reed. After having determined the dimensions of waves while a brisk wind was blowing on the lake, I gave an inflated five-inch automobile inner tube one turn about a long bamboo pole. (Note. The doughnut shaped tube was first cut through opposite the valve and the two ends of the extended tube were then closed.) To my delight, the motor, when in the water and anchored normal to the wave fronts, executed continuous rotation as the reed had done. It was interesting to note that, though the sea was rather violent, the motor maintained a constant level and an even keel for the action was that of a screw rather than that of a boat.

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⁴ Gill's "Oil Analysis," p. 203.