For example, 17·9 mgm. sliced kidney cortex (rat) produced in 140 minutes in the presence of

0·02 *M.* α-ketoglutarate 0·02 *N.* ammonium chloride	0·02 *M.* α-ketoglutarate	
327	136	μl carbon dioxide
222	80	μl succinic acid
234	81	μl glutamic acid

In the presence of molecular oxygen reaction (2) is followed by reaction (3).

(3) glutamic acid + $\frac{1}{2}O_2$ = α-ketoglutaric acid + NH_3;

and the net result of (2) and (3) is the oxidation of ketoglutaric acid to succinic acid and carbon dioxide:

$$COOH.CH_2.CH_2.CO.COOH + \tfrac{1}{2}O_2 = COOH.CH_2.CH_2.COOH + CO_2.$$

The system

glutamic acid ⇌ α-iminoglutaric acid

thus acts as a hydrogen carrier in the oxidation of α-ketoglutaric acid. It has been known for some time that, in kidney, ammonium salts increase the rate of oxidation of α-ketoglutaric acid and of those substances which may give rise to the intermediary formation of α-ketoglutaric acid, namely, glucose, lactic acid and pyruvic acid[3,4]. This may now be explained by the fact that ammonia, according to reaction (2), is required in the oxidation of ketoglutaric acid.

Reaction (2) was not observed in liver, pigeon brain or pigeon breast muscle. Several facts suggest, however, that glutamic acid (or glutamine) acts as a hydrogen carrier in these tissues also, but it is not yet clear from which substrates the hydrogen is accepted. Isocitric acid[5] and β-hydroxybutyric acid[6] which may donate hydrogen to iminoglutaric acid in artificial enzyme systems do not appear to react in the intact cells.

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Tarsiers in Captivity

SPECTRAL tarsiers have been maintained in captivity for varying lengths of time by a number of observers[1,2,3]; but only at stations actually within the area of their geographical distribution (Melanesia). No record has been found of this form reaching the zoological gardens of Europe or North America.

The present note relates to a pair of tarsiers that have been held under laboratory conditions at New Haven, Connecticut, for the past nine months. These specimens, a mature female and her presumptive offspring, a young male, were captured by Mr. J. S. Eckman at Barrio Bad-As, Province of Surigao, N.E. Mindanao, Philippine Islands, in July 1938. Mr. Eckman kept them as pets until October 1938 when, coming to the United States, he brought them at our request to Los Angeles, California, arriving in mid-November. From there they were at once shipped by air to New York, and were received at New Haven on November 18, 1938.

These animals have thriven in captivity, in spite of a somewhat less than ideal environment. During the winter the temperature of their room executed fluctuations ranging from 24° to 30° C., although we sought to maintain an average of 28° C. A crude humidifier was only partially successful. They are kept in a basement room with a north-western exposure, receive no sunlight, and only a low intensity of light. They have received, however, about 3 hours light every other day from a 'Sperti' ultra-violet lamp.

The only food which they have accepted with absolute consistency has been mealworms (Tenebrio larvæ), of which they have taken some 50–60 each per day. To a dish of this food have been added, every day or so, a little salt mixture and a few drops of cod liver oil. New-born mice were eaten, two or three a day each, for the first few weeks that we had the tarsiers; but these are now always refused. Nor will they touch raw beef or liver since becoming accustomed to the live food, and both fruit and milk are always rejected. The weight of the female increased rapidly from 104 gm. to a maximum of around 208 gm.; this probably represents weight regained plus certain fat deposition. The weight of the male has increased more steadily from 106 to 159 gm., most of which increase would appear to represent growth.

The tarsiers are kept in a large cage containing a smaller 'hide-out' cage to which they keep for the greater part of the day, and to which they rapidly retreat when frightened. They emerge around 6 p.m. and are feeding and very active until at least 4 a.m. Their reaction to the ultra-violet light is quite capricious; sometimes they come out and bask within a foot of it, at other times they seek to remain hidden.

The female has been observed to exhibit cyclical swelling of the external genitalia, coupled with a dramatic change in the cellular content of the vagina from the normal mixture of leucocytes and nucleated epithelial cells to complete or almost complete cornification of the epithelials with partial or complete disappearance of leucocytes. The times between the estimated peaks of these cycles have ranged from 23 to 28 days over six such cycles. A sufficiently intensive search for red blood cells in the vaginal lavage has not yet been made. The reproductive status of the male, who would now be somewhat more than a year old, is not known, although erections have been noticed.

Observations on other aspects of the special physiology and behaviour of the tarsiers are being continued.

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Formation of Cleistogamic and Chasmogamic Flowers in Wild Violets as a Photoperiodic Response

IN the spring of 1938, an investigation was undertaken to study experimentally the physiological conditions for cleistogamy in violets. It seemed obvious that the results of Bergdolt[1] do not offer a satisfactory explanation of the occurrence of this phenomenon in Nature. Nutritional difficulties are not likely to occur suddenly and so regularly as to account for the seasonal appearance of cleistogamic and chasmogamic