intake (standard bread), from body stores, or from protein catabolism. We assume that in this long continued anemia there is a stimulus for the dog to utilize all available material to make new and badly needed hemoglobin. The added amino acid may accelerate the flow of other amino acids in the direction of globin production which globin we assume is the limiting factor in certain experiments. When the amino acid feeding experiments are frankly negative we may assume that one or more of the many supplements which the body must add are not available during that particular period and hemoglobin synthesis fails.

If the animal can break up certain amino acids and recombine the mangled remains[4] to form other amino acids and body protein, there is no reason why this same reaction can not take place in the rapid production of the protein hemoglobin in experimental anemia. Therefore it is reasonable to test various simple substances closely related to amino acids to ascertain whether the dog can utilize these substances in hemoglobin construction. Isovaleric acid appears to qualify in this respect and we plan to continue a study of related compounds.

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Some Effects of Feeding Thyroid to Immature Fishes (*Platypoecilus*).

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Striking effects have been obtained by feeding desiccated mammalian thyroid (Parke Davis & Co.) to sexually immature poeciliid fishes of the genus *Platypoecilus*. The details of the response are now under investigation but its general nature may be briefly described.

Control and experimental animals were secured by dividing single progenies and placing them in adjacent tanks. Both groups received routine laboratory feeding—ground liver and young brine shrimp on alternate days. In addition, the experimental groups each morning throughout the experiment received a pinch of thyroid powder scat-

[4] Schoenheimer, R., Ratner, S., and Rittenberg, D., *J. Biol. Chem.*, 1939, **127**, 333.

TABLE I.
Summary of Data on Isolation Age.

Progeny		Treatment	No. of animals	No. of maturing males	Avg isolation age (days)	Range in isolation age (days)
Variatus						
853f	Lot 1	Control	17	6	88.2	64-102
	Lot 2	Thyroid-fed	18	10	39.3	35-53
853i	Lot 1	Control	13	5	84.8	57-166
	Lot 2	Thyroid-fed	14	3	46.3	39-52
	Lot 3	" "	13	4	45.8	39-52
Maculatus						
914c	Lot 1	Control	21	10	189.7	126-215
	Lot 2	Thyroid-fed	21	8	99.1	86-126

tered on the surface of the water. They were observed to feed readily on this powder.

One hundred and thirty-seven fish derived from 7 progenies have been fed thyroid. The results obtained from the study of 3 of these progenies, 2 of *P. variatus* and one of *P. maculatus,* will be described as typical. The essential data on these 3 progenies are summarized in Table I.

All thyroid-fed animals developed marked exophthalmos. After several months of continued feeding the protrusion of the cornea became so great that the eyes stood out globe-like on either side of the head. The protrusion still was clearly apparent after several months of preservation in formalin. In practically all cases exophthalmos was bilateral and equal. In only one of 2 cases was there some degree of inequality.

Both size and body proportions were affected by thyroid feeding. Apart from one exceptional group the experimental fish were always considerably smaller than the controls. In 853i, for instance, 5 weeks after the initiation of thyroid feeding the average body length of the control group was approximately 25% greater than that of the experimental groups. In addition to being smaller thyroid-fed fish are decidedly longer in proportion to their depth with all fins conspicuously elongate.

Sex maturation in treated males (and probably also in females) is speeded if beginning of differentiation of the anal fin into its definitive sex form may be accepted as a criterion. It is part of the routine of this laboratory to isolate sexually immature fish at the first sign of anal fin changes leading to the development of the gonopod or intromittent organ characteristic of the male. This may be referred to as the "isolation age." (See Table I.) Seventeen thyroid-fed *variatus* males were isolated at an average age of 42.4 days while 11 control *variatus* males were isolated at an average age of 86.6

days. In the *maculatus* progeny the average isolation age of 8 thyroid-fed males was 99.1 days, that of 10 control males 189.7 days. The sharp difference in the isolation ages shown by *maculatus* and *variatus* appears to be characteristic of these species (Bellamy—unpublished data). There seems to be little doubt that thyroid feeding results in precocious maturation in both species tested.

Besides being precocious, differentiation of the gonopod in thyroid-fed males is atypical. In the normal male the third, fourth, and fifth anal rays grow out to nearly twice the length of the sixth and seventh and undergo a closely integrated differentiation. In the thyroid-fed male, however, the sixth and seventh rays also participate in the elongation process and the typical relations of the rays are upset. Subsequent differentiation is incomplete and distorted. Description of the details of the process must be postponed for a later publication.

Summary. Thyroid-feeding of immature *Platypoecilus maculatus* and *P. variatus* resulted in exophthalmos, decreased growth rate and altered body proportions, in addition to precocious sex maturation as indicated by the early but atypical differentiation of the male gonopod.

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Cultivation of Various Species of Trypanosomes in the Developing Chick Embryo.

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One of the strains of trypanosomes *(T. rhodesiense)* maintained in this laboratory throughout a period of several years became arsenic-fast for some unknown cause. Cross-transfer to various kinds of mammalian hosts failed to correct this abnormality, hence the idea occurred to us to attempt cultivation of the organism. Since cultivation in artificial media was unsatisfactory, we turned next to the chick embryo as a further possibility.

Early in the work we used the commonly employed window technic but soon found that a simplified method was entirely adequate. Eggs were incubated for 8 or 10 days prior to inoculation. By means of a sterile dissecting needle, two small holes were made through the shell previously cleaned with alcohol. One hole was made into the