drawn on Jan. 11. As this summary is submitted, he has been 40 days on the high sugar and carbohydrate diet without insulin. Blood sugars 2 hours after breakfast have been normal, but afternoon determinations have been irregular and somewhat higher than the morning figures,

Two more patients have been studied. R., age 18 years, had been able to dispense with insulin as the result of successive short periods of high sugar diet. F., age 23 years, had been managed carefully over a period of 2 years. Both responded satisfactorily for a time on high sugar diet when insulin was withdrawn, 11 days for R. and 16 days for F., until increasing and irregular blood sugars indicated that they be returned to the previous diabetic diet. When the diabetic condition was stabilized, the high sugar diet was given again; it was more successful so far as low blood sugar values were concerned, but could be continued no longer than before. A third attempt with both subjects was much less effective, though an increased hypoglycemic response to small insulin dosage was evident; this was probably an influence of the previous high sugar periods.

These results are in accord with the idea earlier suggested that a latent tolerance obtains in many cases of diabetes mellitus. Efforts to restore a normal tolerance, especially in young adults, seem well justified.

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Integumentary Pigmentation in Frog During Metamorphosis, with Especial Reference to Tail Skin Histolysis.

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Several types of larval skin transplantation experiments were made in an attempt to determine the local specificity of frog integument during metamorphosis when transplanted to foreign regions. The grafts involved skin from the back, belly, side and tail. Observations were made with respect to specificity of the integument for pigmentation and histolysis.

Autoplastic and homoplastic larval skin grafts showed local specificity for pigmentation upon larval transformation. All grafts invariably developed the pigment pattern during metamorphosis characteristic of the region from which they had been removed. Skin transplanted from back to side, or side to back, developed nor-

mal spotting characteristic of the region from which they had been taken. Skin transplanted from back to belly and vice versa, produced its normal spotting in the new position.

It is concluded that the integument of the frog *(Rana pipiens)* is specific for pigmentation and the factors responsible for the development of the normal pattern, during metamorphosis, are contained within the skin itself. Moreover, it may be concluded that certain factors within the blood stream are active or become active at a certain stage of metamorphosis and might well be conceived as being responsible for the rapid development of the latent pigmentation pattern present in the various areas of the integument.

Similar transplants involving an interchange of tail skin with skin from the back, suggested a specificity of tail skin toward histolysis. Conversely, skin transplanted from the back to the tail undergoes normal development during metamorphosis and develops the pigmentary pattern characteristic of the region from which it was taken. Instead of such grafts histolyzing and being absorbed due to their contact with atrophying tissues of the tail during metamorphosis, as might be expected, they invariably remained healthy and developed the normal pigment pattern characteristic of back skin. Moreover, the pigmentary changes of such grafts were found to take place simultaneously with the spotting of the back integument. Histological examination showed no signs of cellular histolysis, the integument having the appearance of normal back skin in every respect.

The reciprocal graft, however, in which tail skin was transplanted to the back underwent pronounced degeneration during metamorphosis and presented all of the typical macroscopic signs of histolysis. As metamorphosis progressed, the grafts were resorbed simultaneously with the resorption of the integument of the tail. Histological examination revealed cellular histolysis identical to that typical of histolyzing tail integument during the atrophy of the tail.

The results of the present work serve to throw light on the possible mechanism of tail skin histolysis as it occurs during normal atrophy of the tail during metamorphosis. It has been suggested by Barfurth[1] and Bataillon[2] that atrophy of the tail is induced primarily by the rapid growth of the urostyle during metamorphosis, which serves at least partially to occlude the blood supply to the tail. This, according to Bataillon[2] and Morse[3] would be a possible explanation for the condition of acidosis which occurs in the tissues

[1] Barfurth, D., *Arch. f. miki. Anat.*, 1887, xxix, 1.
[2] Bataillon, E., *Ann. de Universite de Lyons*, 1891, II.
[3] Morse, W., *Biol. Bull.*, 1918, xxxiv, 149.

of the atrophying tail. Morse, furthermore, points out that the acidosis present is sufficient to bring about autolytic reactions resulting in the atrophy of the tail. More recently, however, Helff[4] has shown that the urostyle cannot be the fundamental causative factor involved since typical tail atrophy was found to occur in animals in which the anlagen of the urostyle had been extirpated prior to metamorphosis.

The results of the present work tend to support Helff's contention. The fact that tail integument transplanted to the back undergoes normal histolysis without the presence of adjoining atrophying tissue certainly requires some other explanation. Moreover, the fact that integument from the back transplanted to the tail never undergoes histolysis during tail atrophy is a negation of the idea that tail skin undergoes histolysis during metamorphosis due entirely to its association with the atrophying musculature beneath. It is concluded that 2 factors probably determine the histolysis of tail integument, one of which lies within the skin itself and is specific, and the second, within the blood stream, which becomes functional in inducing histolysis of tail integument at a certain stage of metamorphosis.

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Influence of Superheating on Antirachitic Properties of Irradiated Foods.

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There is some evidence that superheating destroys the antirachitic effect of irradiation.[1] In order to test this point further we have compared over a period of 10 weeks the growth performance of rats which were receiving a rachitic ration[2] with that of animals receiving (1) similar rations which had been irradiated; and (2) the irradiated ration which had been subsequently superheated. This rachitic ration which consisted of a mixture of grains was finely ground, mixed with distilled water and heated until it was of a thick

[4] Helff, O. M., *Anat. Rec.*, 1928, Dec., 39.

[1] Honeywell, H. E., Dutcher, A. R., and Dahle, C. D., *J. Biol. Chem.*, 1927, lxxiv, 77.

[2] McCollum, E. V., Simmonds, Nina, Parsons, H. T., Shipley, P. G., and Park, E. A., *J. Biol. Chem.*, 1920, xlv, 333.