CLXXIX. NOTE ON THE ATTEMPTED ACTIVATION OF TYROSINE BY ULTRA-VIOLET IRRADIATION.

BY STANISŁAW KAZIMIERZ KON AND THOMAS MOORE.

From the Biochemical Laboratory, Cambridge.

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IN the course of a recent paper on the ultra-violet irradiation of rations Waltner [1927] has claimed that pure tyrosine may be rendered antirachitic by such treatment. Although this statement finds no support in the theory of specific sterol activation now generally accepted, the importance of tyrosine in melanin formation on the one hand, and the relation of protective pigmentation to irradiation on the other, led us to put the matter to independent test. As a result we are unable to confirm the view that tyrosine may be rendered antirachitic.

EXPERIMENTAL.

A sample of tyrosine, to ensure freedom from impurities of a fatty nature, was extracted with ether for 48 hours in a Soxhlet apparatus. One portion was then exposed in a thin layer before a mercury arc lamp for a period of 20 minutes at a distance of 50 cm., the remainder was retained for use in the negative control diet. For use in the positive control diet a sample of ergosterol supplied by the British Drug Houses was exposed at the same time as the tyrosine to the radiations of the same lamp.

In order to eliminate the possibility of fortuitous healing through fall of food intake, etc., it was decided that the curative method, employed by Waltner, should not be adopted, but that the materials should be tested by their efficiency in preventing rickets when introduced into the diet from the outset. Twelve young albino rats were divided into three groups. Two rats (Group I) received the McCollum diet 3143 with the daily supplement of 0.1 mg. of irradiated ergosterol suspended in liquid paraffin; five rats (Group II) received diet 3143 with the admixture of 0.5 % of irradiated tyrosine; the remaining five received the same diet containing a similar amount of tyrosine which had not been irradiated. After 45 days the rats were killed and their bones examined, with the results shown in the table.

It will be seen that whereas almost normal bones were observed in the case of the two rats which had received irradiated ergosterol, no distinction in the severity of rickets could be drawn between the remaining two groups,

symptoms in the case of rats which had received irradiated tyrosine being as gross as in the case of rats which had received the material without irradiation. Therefore, while such results do not rule out the possibility that irradiated tyrosine may have some slight healing effect on rickets in its early stages, it is obvious that its continued administration cannot prevent or moderate the progress of rickets in the case of the rat.

Table I.

	Weight (g.)	State of ribs	Diagnosis
Group I (irradiated ergosterol).			
♂	42-92	Normal for 3143 diet	Normal
♀	39-74	Normal for 3143 diet	Normal
Group II (irradiated tyrosine).			
♀	47-92	Costochondral junctions blurred. Three ribs fractured. Marked angulation	Severe rickets
♀	49-72	Junctions much enlarged with cupping, lines blurred. Four ribs fractured. Some angulation	Severe rickets
♂	39-90	Junctions much enlarged, lines fairly distinct. Two ribs fractured. Marked angulation	Severe rickets
♂	45-82	Junctions enlarged with lines slightly blurred. Four ribs fractured. Slight angulation	Severe rickets
♂	49-76	Junctions almost normal, but two ribs fractured. No angulation	Slight rickets
Group III (non-irradiated tyrosine).			
♀	40-71	Junctions enlarged and cupped, lines blurred. Four ribs fractured with partial collapse of thorax on left side	Very severe rickets
♂	44-61	Junction lines fairly distinct. Eleven ribs fractured. Severe angulation	Very severe rickets
♂	46-109	Junction lines fairly distinct. One rib fractured. Angulation on left side	Moderate rickets
♂	49-116	Junction lines rather blurred. Very slight angulation	Slight rickets
♀	52-102	Junctions slightly enlarged and lines rather blurred. No angulation	Very slight rickets

SUMMARY.

Irradiated tyrosine admixed at the rate of 0.5 % in the McCollum diet 3143 is ineffective in moderating the course of rickets in rats.

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REFERENCE.

Waltner (1927). *Magyar Orvosi Arch.* 28, 19.