Passion regimented; curiosity regimented; endeavor regimented;
Culture, and grace, and all the things I cared for
Equally divided among the mob, and sauced to their taste!

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PROPOSED CHEMICAL MECHANISMS FOR THE PRODUCTION OF SKIN ERYTHEMA AND PIGMENTATION BY RADIANT ENERGY

IN 1927 Lewis[1] made the suggestion that the skin erythema produced by various physical agents, including radiant energy, was due to the liberation or formation of some histamine-like compound which he called the H-substance. About this same time Harris[2] found that alcoholic extracts of skin contained a substance with the pharmacological properties of histamine. As this substance appeared in the tissue spaces, it apparently disappeared from the tissue cells. The following year Ellinger[3] began his attack on the problem by irradiating histidine with the rays from a quartz-mercury lamp. This procedure resulted in the production of an active substance which Ellinger considered to be histamine. It was reported in these papers that the active substance was formed by the physiologically active rays (290 to 320 millimicrons) as rapidly as by the shorter rays, provided the total energy were maintained constant. The very interesting experiments of Szendrö[4] have since shown that the active compound produced in Ellinger's experiments was not histamine but imidazoleacetaldehyde. The physiological importance of Ellinger's discovery has been questioned by Bourdillon, Gaddum and Jenkins.[5] These workers reported that the production of the active compound by the physiologically active ultra-violet wave-lengths was too slow to account for the production of erythema. It is apparent that more work must be done before the controversy regarding the production of imidazoleacetaldehyde from histidine by means of the near ultra-violet can be settled.

Raper and his co-workers[6] have shown that the enzyme tyrosinase will catalyze the conversion of tyrosine to dopa (3, 4-dihydroxyphenylalanine); dopa is then oxidized, in the presence of the same enzyme, to a red indole derivative which spontaneously changes to melanin. There is as yet, however, no direct proof that this mechanism operates in mammals, since tyrosinase has been isolated only from plants and the lower forms of animal life. Bloch[7] has demonstrated the presence of an enzyme, dopa oxidase, in the melanoblasts of the skin. This enzyme catalyzes the conversion of dopa to melanin, but it has no action on tyrosine. In experiments, which will be published in complete form shortly, the author has found that tyrosine is converted to dopa by ultra-violet light. This reaction will occur even if the tyrosine solution is separated from the light source by means of a thin glass filter, although it is slower under these conditions. As might be expected, dopa can be produced by this method only in the presence of oxygen. Changes in the ultra-violet absorption spectra of irradiated proteins have led to the suggestion that dopa may be formed from tyrosine even when the latter is combined in the protein molecule,[8] but this hypothesis has not yet been tested directly. This work suggests that skin pigmentation produced by radiant energy is the direct result of the conversion of tyrosine to dopa, the latter being converted to melanin by dopa oxidase.

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A MICROBIOLOGICAL TEST FOR CARCINOGENIC HYDROCARBONS

WITHIN recent years the researches of various groups have definitely shown that certain synthetic hydrocarbons are capable of inducing cancerous growths in mice. In the attempt to extend these findings, new syntheses have been made in order to obtain a better understanding of the chemistry of carcinomas.

Since the carcinogenic hydrocarbons bring about such marked changes in tissue cells, it was hypothesized that they might also cause marked physiological changes in unicellular organisms. Using a bacterium, *Escherichia communior,* and a simple synthetic culture medium, direct total counts of the numbers of organisms per unit time indicate that certain carcinogenic hydrocarbons accelerate the rate of reproduction of the test organism. Typical growth curves with 1,2,5,6 dibenzanthracene and with methylcholanthrene show approximately 50 per cent. more organisms in the eighth to ninth hour of growth than control cultures.

With phenanthrene, a non-carcinogenic hydrocarbon, repeated tests showed curves identical with the controls. If these results may be taken as presumptive evidence of a correlation between carcinogenicity and stimulation of bacterial growth, it seems possible that if an extension of this study to other hydrocarbons shows such a correlation to be general, a short microbiological test for carcinogenic hydrocarbons may replace the tedious methods available at present.

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