

opaque paper, were stood in our dairy alongside the sale milk. We then observed that in all cases exposure to light had resulted in the rapid destruction of the labile factor while the loss in the samples protected from light was comparatively quite small.

On the other hand, we have found that common bacteria known to induce a low E_h in milk may play a part in the protection of the labile factor.

It seems obvious from our experiments that any work upon the stability of the labile factor to physical and chemical agents, such as heat or oxidation, must exclude the complicating factor of destruction by light.

Further work on these phenomena is in progress. Meanwhile it seems safe to say that our observations on the action of light emphasise the value of Nature's method of transference of milk from mother to offspring.

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¹ NATURE, 132, 64, July 8, 1933.

² Chem. Ind., 52, 159; 1933; Biochem. J., 27, 590; 1933.

Addition of Hydrogen Bromide to Olefines

In some recent memoirs Kharasch¹ has observed that the dominant factor in the addition of hydrogen bromide to some olefinic substances is the presence or absence of oxygen. For example, the slow combination of hydrogen bromide and vinyl bromide forming ethylidene bromide gives place to a rapid formation of ethylene bromide if air is admitted.

The addition of hydrogen bromide to undecylenic acid is often carried out for the preparation of κ -bromoundecic acid. That this reaction has given either the κ -bromo- or the ι -bromoacid in an apparently arbitrary manner is evident from the literature², and the cause is now seen to be the presence or absence of oxygen. Eight experiments in which hydrogen bromide was passed into a ten per cent solution of undecylenic acid in ligroin gave 70–80 per cent yields of almost pure κ -bromoundecic acid; four experiments in which oxygen was removed either by passage of hydrogen or by addition of diphenylamine or by both methods gave a mixed product in which the ι -bromo-isomeride predominated.

Thus the very important observations of Kharasch are confirmed.

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¹ Kharasch and Mayo, *J. Amer. Chem. Soc.*, 55, 2468; 1933. Kharasch, McNab and Mayo, *ibid.*, 2521, 2531.

² Walker and Lumsden, *J.C.S.*, 79, 1191; 1901. Fairweather, *Proc. Roy. Soc. Edin.*, 46, 72; 1926. Cohen, *J.C.S.*, 594; 1932.

Photo-Chemical Activation of Adenine

EARLIER¹ it was found that adenine sulphate on irradiation by a mercury arc acquired growth-promoting properties. The material was tested on rats, receiving a synthetic basal diet deficient in vitamin B, supplemented by ox kidney extract as a source of vitamin B₂. Since those preliminary experiments a large number of tests have been

carried out with rats and pigeons. In most experiments adenine sulphate in aqueous suspension (slightly acidified) was exposed to a Hanovia Home Sun (220 volts, consuming 2.1 amp.) at 15 cm. distance for $\frac{1}{2}$ –1 hour. The irradiated product has proved unable to cure 'polyneuritis' in pigeons even in 5 mgm. doses. But the same daily dose supported growth in 36 young rats which had ceased to grow on a diet composed of starch, caseinogen and McCollum's salt mixture supplemented by cod liver oil and an aqueous extract of ox kidney, which provided vitamin B₂ and a small quantity of vitamin B₁. Irradiated adenine gave no response in young rats (31 in number), receiving ox liver extract or autoclaved marmite as the source of vitamin B₂. Irradiated guanine chloride, cytosine chloride and uracil did not resemble the action of irradiated adenine in preliminary experiments (7 rats were used). Irradiated adenine could not replace vitamin B₂ in the diet.

The above results indicate the formation of a growth promoting substance on irradiation of adenine. The optimum conditions of activation have, however, not yet been obtained. The relation of this active factor to the different B-vitamins is being studied. Until further results are obtained, it is not profitable to discuss these results in relation to those published by Heyroth and Loofbourow², Heard *et al.*³, and Bernal and Crowfoot⁴.

The details are being published in the *Journal of the Indian Chemical Society*.

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¹ Guha and Chakravorty, NATURE, 130, 741, Nov. 12, 1932.

² Heyroth and Loofbourow, *ibid.*, 131, 92, Jan. 21, 1933.

³ Heard *et al.*, *ibid.*, 131, 617, April 29, 1933.

⁴ Bernal and Crowfoot, *ibid.*, 131, 911, June 24, 1933.

Seismic Sea Waves

In a note on the sea waves of the Japanese earthquake of March 2, 1933, which appeared in NATURE of July 8, it is stated that "it was clear" that the waves would travel 3,950 miles—presumably sea ones—in about 8½ hours. It is understood that this calculation is based on the assumption that the waves must be 'long' ones, so that they would conform with the formula $v^2 = gd$, and progress with a speed independent of period or length, the mean depth of water being the sole relevant factor. The time of arrival of the waves indicates that this assumption is probably correct, but nevertheless it might be interesting if those in a position to anticipate the arrival of waves of this sort were to time their periods. So far as I know, but little has been published about the character of sea waves generated by earthquakes. If the periods were observed, especially when the seismograph only indicates a single severe shock, in which case the original disturbance should presumably consist of one solitary wave, comparison of the actual with the theoretical periods should give a good indication as to the accuracy with which hydrodynamical theory works out in practice.

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