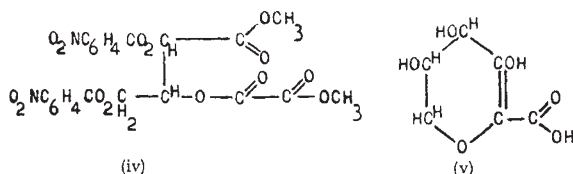


$C_8H_4O_2(OCH_3)_2(OCOC_6H_4NO_2)_2$ . (Mol. wt. in camphor and in benzene.)

Since no reduction in the size of the molecule has occurred, the double bond must exist in a ring. Further, since neither carbonyl nor free carboxyl groups are produced, both the carbon atoms associated with the double bond must be attached to ether-linked oxygen atoms. The ozonisation product is thus formulated as (iv), as the methyl ester of a trihydroxybutyric acid, in which two of the hydroxyl groups are esterified with *p*-nitrobenzoic acid and the third with oxalic acid monomethylester.



In agreement with this, five equivalents of alkali are used in its hydrolysis. The oxalic acid so produced was collected as calcium oxalate and after re-solution titrated with permanganate. The trihydroxybutyric acid is optically active, but its examination is not yet completed. The powerful reducing properties of the vitamin are related to the H-atom, attached to the  $C_2$ -atom, which may be readily oxidised to hydroxyl. Its replacement by  $CH_3$ , in the enol-form (ii), gives rise in the case of the dimethylvitamin, to a substance stable to oxidising agents. Since the oxidation product is a furanose derivative, its great reactivity is understandable. Besides the structure (i) (and ii), the structure (v), with its corresponding enol-form, may also be possible. In consideration, however, of the observations of Cox, Hirst and Reynolds<sup>2</sup> (production of *d*-threonic acid by permanganate oxidation; formation of furfural) the formula (v) is excluded (it would yield erythronic acid, since the vitamin gives a monoacetone derivative). Since we have examined the constitution by the mildest chemical methods, secondary changes in this most reactive molecule are excluded. A detailed communication will appear elsewhere<sup>3</sup>.

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<sup>1</sup> 1st communication, *Naturwiss.*, 21, 63; 1933.

<sup>2</sup> NATURE, 130, 888, Dec. 10, 1932.

<sup>3</sup> The substance of this letter was communicated to the Göttingen Chemical Society on January 28.

### A Carotene Derivative giving with Antimony Trichloride an Absorption Band at 610-630 $m\mu$ .

CAROTENE and vitamin A share with a variety of polyene substances the property of giving a blue solution with antimony trichloride in chloroform. Spectroscopical research shows that carotene gives a specific absorption band with a maximum at 583-590  $m\mu$ , whereas vitamin A gives a maximum absorption band at 606-620  $m\mu$  with the antimony trichloride reagent.

It is very probable that carotene is converted into vitamin A in the body. Until now, it has not been possible to obtain this reaction *in vitro* by purely chemical treatment.

Recently we have obtained a carotene derivative with an absorption band at 610-630  $m\mu$  with the Carr and Price reagent. 150 mgm. of carotene (from carrots) is boiled under a reflux condenser for 15 minutes with a mixture of 100 c.c. of acetone and 1 c.c. of hydriodic acid (sp.gr. 1.7). After cooling to room temperature, 150 c.c. of petroleum ether is added and the acetone washed away with water. The petroleum ether solution is vigorously shaken up for some time with a strong sodium thiosulphate solution. With antimony trichloride in chloroform (with addition of one drop of acetic acid anhydride) a blue colour develops with absorption down to 640  $m\mu$ .

The petroleum ether solution, to which is added 20 c.c. of 1 per cent sulphuric acid, is shaken up with small quantities of a dilute (1 per cent) sodium nitrite solution, testing from time to time with the antimony trichloride reagent. A strong absorption band at 610-630  $m\mu$  appears. A product with maximum absorption is approximately reached when the colour of the petroleum ether solution has nearly disappeared.

Too much sodium nitrite causes a redder Carr and Price reaction, whereas the absorption at 610-630  $m\mu$  decreases.

The substance, although a derivative of carotene and giving the same absorption band as vitamin A, was found to be devoid of growth-promoting activity; small quantities of indol and the inhibitor of cod liver oil caused inhibition of the absorption band.

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### Induction by Coagulated Organisers in the Chick Embryo

IN a series of short communications, Bautzmann, Holtfreter, Spemann and Mangold<sup>1</sup> have recently reported the results of experiments in which they attempted to obtain typical organiser reactions (that is, the induction of a neural plate in the presumptive epidermis in *Triton*) by organisers which had been killed. Marx<sup>2</sup> had previously demonstrated that inductions could be performed by organisers which had been narcotised by trichlorobutyl alcohol to such an extent that they degenerated and were absorbed, while Spemann<sup>3</sup> had obtained inductions by organisers which had been crushed, but not by those which had been frozen or dried.

Holtfreter has been by far the most successful of the newer workers; he reports large and typical inductions by organisers dried at 60°C., or heated to 100°C., or frozen, acting upon either isolated pieces of presumptive epidermis or on the same tissue in its normal place in the embryo. Bautzmann describes two structures, induced by organisers which had been heated to about 60°C., which he is inclined to interpret, now that the possibility has been proved by Holtfreter, as atypical induced neural plates. Spemann has obtained one induction by an organiser killed in 96 per cent alcohol, and Mangold reports some doubtful cases which raise the possibility that the inducing agent can diffuse into agar blocks.

Since October 1931 I have been attempting to obtain inductions by dead organisers in the chick embryo, the organisers being killed either by heat or by acetone. But it was usually found that the dead implanted substance became enveloped by