Fig. 2. Chromatographic profiles of the tritiated DNA used and the tritiated DNA found in the plants. A-F, Black, tritiated DNA given to the plant; white, tritiated DNA found in the plant after incubation; G-H, black, hydrolysed tritiated DNA given to the plant; white, tritiated DNA found in the plant after incubation; I-J, tritiated DNA found in the plant after feeding with tritiated thymidine. Stripes, acid insoluble fractions. (Fraction 0, molecular weight 200-2,000; fraction 3, molecular weight 50,000; fraction 4, molecular weight 500,000; fraction 7, molecular weight 1,000,000; fraction 12, molecular weight 5,000,000).

cells) are very similar. This might suggest that DNA is depolymerized in the xylem and taken up by the nuclei without further modifications of the polymerization state (if not of the base composition). It also might indicate that the chromatographic profiles are merely the reflexion of the selective uptake of certain fractions—the low polymerized ones being more easily absorbed. To verify this point, we added an excess of fraction 4 (molecular weight = 500,000), not radioactive, to highly polymerized tritiated DNA. No dilution of the radioactivity can be found in the fraction 4 recovered from the tomato plant, so that it seems likely that its presence in the tissue is not due to a selective uptake but rather to a partial depolymerization. A kinetic study performed *in vitro* with plant sap added to polymerized tritiated DNA shows that, after incubation for 1 h, the radioactivity is found mainly in fraction 4, whatever the molecular weight of the tritiated DNA. We studied this phenomenon for up to 96 h, and found that this profile remains constant, showing that a depolymerization seems to occur but does not proceed further to the production of lower molecular weight material.

Our results show that the quantity and degree of polymerization of the labelled molecules which appear and remain in the tomato cells depend on the type of precursor used. While the real identity of the labelled molecules is still unknown, these results suggest that exogenous DNA molecules could migrate in the xylem of tomato plant and, after some depolymerization, be taken up by the meristematic cells.

Preliminary results from ultracentrifugation in a caesium chloride gradient seem to show that part of the radioactivity

found in a plant 48 h after the feeding of *E. coli* DNA is supplied by molecules which sediment in the same position as an *E. coli* DNA, or in an intermediate position.

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¹ Ledoux, L., and Huart, R., *Arch. Intern. Physiol. Biochim.*, **73**, 873 (1965).

² Ledoux, L., in *Prog. Nucleic Acid Res. and Mol. Biol.*, **4**, 231, edit. by Davidson, J. N., and Cohn, W. E. (Academic Press, 1965).

³ Marmur, J., *J. Mol. Biol.*, **3**, 208 (1961).

⁴ Pelc, S. R., *Intern. J. App. Rad. Isotop.*, **1**, 172 (1956).

⁵ Davila, C., Charles, P., and Ledoux, L., *J. Chromatog.*, **19**, 382 (1965).

Analysis in Protein Iodination Systems

ANALYTICAL determinations in protein iodination systems are likely to produce erroneous and anomalous results unless the chemical complexity of the mixture and the lability of some of the reactants are taken into account.

Recently a number of methods for the separation of protein-bound iodine from iodide have been compared¹. Acceptable results were obtained in all cases except when trichloroacetic acid was used to precipitate protein in the presence of carrier iodate; in this case the proportion of iodine bound to protein was high. The authors rightly point out that such procedures may give results which are at variance with other procedures.

It is to be expected that exposure of a protein to iodide-¹³¹I and iodate in strongly acid conditions will result in chemical binding of the iodine-131 to protein². If such a system is used to separate protein-bound iodine from iodide, erroneous results will be obtained because the proportion of these two substances will be altered considerably by the conditions used in the separation. We have demonstrated that this would occur under the conditions quoted by Baker and Owen by separating the precipitated protein from the supernatant liquid arising from such a mixture and by showing with paper electrophoresis (after re-resolution of the precipitate) that the major portion of the iodine-131 in the latter was iodinated protein. In addition, in place of trichloroacetic acid in the mixture we have substituted sufficient dilute hydrochloric acid to produce a solution of the same pH; the expected iodination again occurred but without precipitation.

Because commercial supplies of iodine isotopes for protein iodination are distributed without added reducing agent, oxidizing radicals produced by radiolysis of water are liable to convert iodine-¹³¹I to iodate-¹³¹I. The rate of this conversion depends on a number of factors but can certainly amount to 1 per cent per day. At the specific activities normally used 1 mc. of iodine-131 of which 10 per cent had been converted to iodate would contain only 5-10 μ g of iodine as iodate. Attempts in these laboratories to utilize this iodate in reaction with iodide at acid pH have been unsuccessful; it is unlikely that anomalous analytical results similar to those reported will arise from this cause.

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¹ Baker, W. T., and Owen, G., *Nature*, **211**, 641 (1966).

² Francis, G. E., Mulligan, W., and Wormall, A., *Nature*, **167**, 748 (1951).