cations. Patients with jaundice, cirrhosis of the liver, leukemia, arteriosclerosis, rheumatic fever, acute pneumonia, and other conditions were included in this test.

TABLE 1

A COMPARISON OF FLUOROMETRIC AND BACTERIOLOGIC METHODS OF DETERMINING SERUM AUREOMYCIN CONCENTRATIONS

Patient	Aureomycin dosage	Time after administering dosage	Fluorometric levels μg/ml	Bacteriologic levels μg/ml
C. W.	9.3 mg/kg orally	Control*	0	0
		1 hr	1	0
		2 hr	4	2.5
		4 hr	5	2.5
		6 hr	4	1.25
		8 hr	3	1.25
		12 hr	1	0.3
		24 hr	0.2	0
J. W.	10.4 mg/kg orally	Control*	0	0
		1 hr	1.3	0
		2 hr	1.7	0
		4 hr	3	2.5
		6 hr	2	1.25
		8 hr	3	1.25
		24 hr	0.5	0
W.	200 mg I. V.	Control*	0	0†
		75 min	3	2†
R.	200 mg I. V.	Control	0	0†
		30 min	2	0.5†
B. W.	? I. V.	75 min	1	1†
B. R.	?	30 min	1	0.5†
M. W.	200 mg I. V.	Control*	0	0†
		5 min	15	10†
		15 min	3	1.25†
		30 min	3	1†
		60 min	2.5	1†

* Control tests were performed on patient's sera before aureomycin dosage.

† These bacteriological levels were performed by Dr. Caroline A. Chandler of The Johns Hopkins Medical School.

They had received a variety of medications including sulfa drugs, penicillin, dicumarol, salicylates, and vitamins. In addition, streptomycin and chloramphenicol were each added to a serum containing aureomycin. In no case was anything found which interfered with the fluorometric test.

In the few determinations reported, there is a general correlation between the fluorometric and bacteriological assays. The fluorometric test appears to give slightly higher readings than the bacteriologic test. This suggests that the fluorometric test is measuring not only aureomycin but, in addition, something which is closely allied to and associated with aureomycin and which is bacteriologically inactive. Efforts are being made to define further the accuracy of the fluorometric test.

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Preparation of C^{14} Uniformly Labeled Fructose by Means of Photosynthesis and Paper Chromatography[1]

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The common carbohydrates, glucose, fructose, sucrose, and starch have been labeled with C^{14} by allowing leaves to photosynthesize in the presence of $C^{14}O_2$. However, only glucose, sucrose, and starch have been prepared with sufficient purity and activity to permit their use in tracer experiments. Fructose has not been available for tracer work because of the difficulty in separating it from glucose following sucrose hydrolysis. Putman *et al.* (*5*) used the calcium-fructose complex methods as described by Bates and associates (*1*). This method has two disadvantages: large amounts of carrier fructose are added, yielding a product of very low specific activity; and the fructose still contains appreciable amounts of glucose.

Recently Partridge (*4*) applied paper chromatography to the qualitative analysis of reducing sugars. The separation of glucose from fructose on a one-dimensional chromatogram using phenol as the solvent is very good (R_f glucose -0.39, R_f fructose -0.51). A 1-in. strip of paper can be used to separate as much as 0.3 mg of fructose from a similar amount of glucose. By using several strips of paper, we have prepared in very pure form milligram amounts of highly active fructose.

After four trifoliate bean leaves had been allowed to photosynthesize in the presence of 2.8 mc of $C^{14}O_2$ (*3*), they were killed in hot 80% alcohol. This alcohol extract contains sucrose, glucose, and fructose as well as other alcohol-soluble substances. After ether extraction and passage through ion exchange columns (Amberlite 100-H and Duolite A-4) to remove polar compounds, H_2SO_4 was added to make the solution 1 *N* and it was kept at 80° C for 10 min. After hydrolysis, the sample was again passed through the ion exchange columns to remove the acid. Most of the glucose was crystallized from the mixture by the addition of carrier glucose followed by the addition of alcohol.

To separate the fructose from the glucose still remaining in the mother liquor, 75 chromatograms (14×1.5-in. strips of Whatman No. 1 filter paper) were set up with 0.1–0.3 mg of sugar per strip. After development with phenol, the strips were air-dried and placed on x-ray plates (Eastman Type K). It is evident from Fig. 1 that a radioautograph of each strip is necessary, since the bands are not always in the same position. In about 2 hr the radioautographs were dark enough to permit tracing of the outlines of the bands onto the chromatograms. The outlined fructose bands were cut out and pooled, giving a total of about 2 g of filter paper. About

[1] Research carried out at Brookhaven National Laboratory under the auspices of the Atomic Energy Commission.

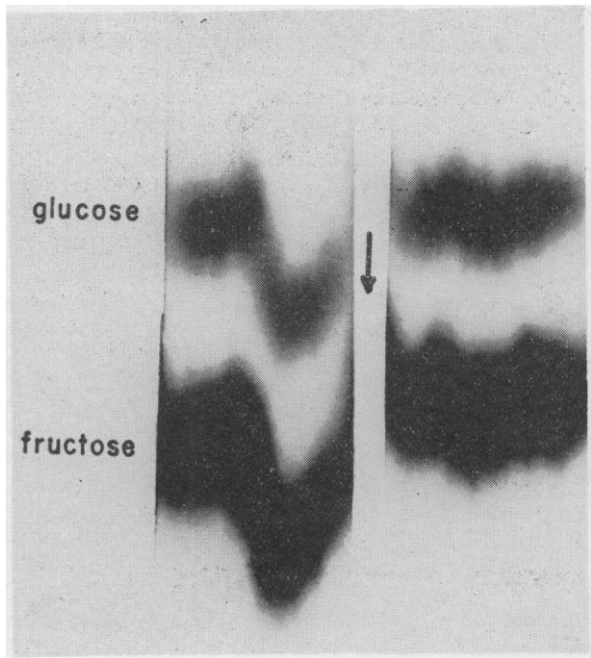

FIG. 1. Radioautograph of chromatogram of glucose and fructose.

10 mg of fructose was eluted from the paper by boiling the paper with 80% alcohol, followed by Soxhlet extraction for 5 hr. The alcohol was removed by vacuum distillation, water being added from time to time. The aqueous solution was extracted with ether to remove traces of phenol. To remove other impurities, the solution was passed through ion exchange columns (Amberlite 100-H and Duolite A-4) with 30 mg of carrier fructose added. The resultant solution (about 300 ml) was concentrated at 35° C to a small volume and finally concentrated to a syrup in a vacuum oven at 35° C.

The syrup was crystallized as described by Putman *et al.* (*5*). Thirty mg of fructose was added during the crystallization. Since the amount of fructose was small, it was found convenient to carry out the crystallization steps in a centrifuge tube and to collect the fructose by centrifuging in a refrigerated centrifuge. The purity of the fructose was determined by paper chromatography, using as solvent butanol and water saturated with propionic acid (*2*). Only one band was found. The final product had a specific activity of 1.2 mc/mg of fructose. A portion of the fructose was degraded by the microbiological method of Wood, Lifson, and Lorber (*6*) and found to be uniformly labeled.

Many groups of compounds other than sugars—for example, amino acids, peptides, and carboxylic acids—can be subjected to chromatography on paper in milligram quantities. This large capacity and the simplicity of the technique make paper chromatography valuable for the isolation of such compounds as well as for their assay.

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A Megalonyx Tooth from the Northwest Territories, Canada

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Among a miscellaneous collection of fossils submitted by Galen B. Smith to the junior author for identification, there was one specimen which deserves special attention. It was a tooth of a ground sloth, and according to Mr. Smith was obtained at Lower Carp Lake, north of Great Slave Lake in the Yellowknife region.[1] It was associated with fragments of a mastodon tooth. The specimen was sent to the senior author for detailed study.

The tooth (No. 15208, Academy of Natural Sciences, Philadelphia—Fig. 1a,b), is like the second lower cheek tooth of *Megalonyx* in shape and straightness of crown. It also resembles in cross section the second upper cheek tooth in this genus. While the wearing surface of the

FIG. 1. *Megalonyx* cf. *jeffersonii* (Desmarest). Lower cheek tooth, No. 15208 Academy of Natural Sciences, Philadelphia. (a) Occlusal view; (b) anterior (?) view. Natural size. Pleistocene, Yellowknife region, Northwest Territory, Canada.

tooth is somewhat abraded, the features which result directly from its occlusion with opposing teeth can be ob-

[1] 63° 35′ N; 114° 10′ W. See Rae sheet (85 NW-NE) National Topographic Series of Canada.