to direct the atmosphere through the trap flask during the early stages of evacuation. This assembly is inserted through the top female joint of the body.

The operation and efficiency of this modification are as described by Holzman. The advantages are a more rugged structure and a simpler construction.

As pointed out by Campbell and Pressman (*1*), it is convenient to stopper unused ports of the apparatus with sealed-off standard tapers, which may also be used for drying small samples of material.

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Sulfapyrazine Precipitated in Cancer Tissue upon Repeated Glucose Injections[1]

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Cancer tissue, unlike most normal tissues, produces large quantities of lactic acid aerobically. The acid production can be increased by intraperitoneal injection of glucose to the point that the pH of the extracellular fluid often drops below 6.4, as measured by glass electrode (*1*). This fact has enabled us to produce high local concentration in cancer tissue of a compound administered at a site distant from the tumor. The compound used, sulfapyrazine, was precipitated in the tumor presumably because it is less soluble at acid pH than at pH 7.4. Rats with Walker tumor 256 were used.[3]

As an example we give the concentrations of sulfapyrazine found in 2 implants of tumor 256 and in other tissues taken from a 400-g rat injected 3 days earlier with sulfapyrazine. The tumors were subcutaneous in the interscapular region. When they were 16 days old, the rat was given a single subcutaneous injection in the hind leg of 55% aqueous sodium sulfapyrazine containing 0.5 g of sulfapyrazine. During the 3-day period 14 g of glucose were given intraperitoneally in 50% solution. The rat was then killed by bleeding under ether anesthesia. The tumors were flecked with white precipitate and were necrotic throughout. Tissues were weighed, digested in alkali, aliquots were precipitated with *p*-toluenesulfonic acid, and the sulfapyrazine was determined colorimetrically by the Bratton and Marshall technique (*2*).

Serum taken from the heart at sacrifice contained 87 mg of sulfapyrazine/100 ml, the blood 93% as much, the small tumor (4.5 g) 330%, the large tumor (6.6 g) 280%, kidneys 100%, stomach (without forestomach) 95%, hide 94%, small intestine (upper 8 cm) 83%, heart 73%, lungs 72%, liver 69%, spleen 61%, leg muscle 55%, and testes 54%.

TABLE 1

Data on 250 Rats with Walker Tumor 256 Killed After Subcutaneous Injection of Sulfapyrazine

Mg of sulfa injected/ 100 g body weight	Hours between sulfa injection and killing	Sulfa/g of tumor divided by sulfa/ml of serum			Sulfa/g of kidney divided by sulfa/ml of serum		
		> 1	< 1	Chi square*	> 1	< 1	Chi square*
		No. rats			No. rats		
Repeated injections of glucose							
100–200	20–97	31	14	6.4	9	36	14
Single injection of glucose							
200–1,000	3–20	26	79	27	31	74	18
No glucose injected							
200–1,000	3–20	29	71	18	75	25	25

* All probabilities are less than 0.01 except for the smallest chi square, of which the probability is between 0.01 and 0.02.

Table 1 illustrates conditions in which similar concentration of sulfapyrazine in tumors did and did not occur. Highest concentrations were found in necrotic tissue. The quantities injected are generally lethal. The tumors had a median weight of 1.28% of the body weight, none more than 13%.

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Measurement of the Extract of Cornstalks

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By extract is meant the water-soluble content in terms of the Brix sugar scale (*3*). In its measurement the assumption is made that the water, as well as the soluble solids, is uniformly distributed throughout the sample. It is necessary to know the total moisture content, and the Brix reading of the juice at or near 20° C. If sufficient juice cannot be obtained, a known amount of water is mixed with the sample, the diluted juice is expressed, and its Brix reading measured. The method is rapid, does not require expensive equipment, and is far more easily operated than any of the other sugar estimation methods. Clark (*1*) has found that approximately two-

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[2] We are indebted to Gustav Eckstein for his assistance and encouragement in this work, to Martin Fischer for laboratory facilities, and to Paul H. Stewart, Paul R. Henry, and Louis Soffer for technical assistance in the early stages of the work.

[3] Tumor supplied through the courtesy of John B. Storer. Department of Pathology, University of Chicago.

TABLE 1

SHOWING EXTRACT OF MATURE CORNSTALKS

Sample No.	Dry weight, % of fresh weight	Total water, g	Brix, corr. to 20° C	Extract, % of dry weight	Extract, % of stalks
1	22.0	297	2.11	21.3	4.69
2	26.53	326	4.28	48.6	12.86
3	18.68	294	3.57	35.9	6.71
4	15.36	297	2.38	24.1	3.70
5	32.77	295	2.08	20.9	6.85
6	28.21	330	3.28	37.3	11.52
7	23.36	306	3.68	39.0	10.52
8	24.06	305	3.03	31.8	7.65
9	32.83	305	4.88	52.1	17.10
10	28.18	303	3.98	39.9	11.24
11	26.67	319	2.78	36.1	9.63
12	18.38	302	2.78	28.8	5.29

thirds of the soluble solids of normal mature cornstalks consist of sugars.

The method was used here to measure the extract content of stalks of different varieties of hybrid corn that had borne mature ears.[1] Single stalks of 12 strains of hybrid corn were analyzed. The data, although not representing statistical averages, as would have been desirable, illustrate the application of the method and show in general the magnitude of the soluble solids differences found among stalks of different genetic origin.

Each stalk was finely ground by passing it through a motorized saw-blade grinder (*2*). The ground material was weighed, spread on a cloth-covered tray, and dried to constant weight at slightly below 50° C in an electrically heated dryer. It has been shown by Sayre and Morris (*4*) that drying cornstalk tissue at about 48° C gives correct dry weight percentages.

Thirty-gram samples of dry cornstalk were mixed in tared glass jars with approximately 300 ml of hot water, let stand to cool and to allow time for equilibrium to become established, then weighed, pressed in a tincture press, and the sp g of the juice measured by Brix spindle. To calculate percentage of extract, the weight of water present was divided by 100, minus the corrected Brix reading, and multiplied by 100. This gave weight of juice. This value, times the corrected Brix reading and divided by 100, gave the weight of juice solids in the 30 g of sample taken in terms of the sugar scale. Example: the corrected Brix was 2.11 and the total water present was 297 g, making the weight of juice 303.4 g. The weight of juice solids was $303.4 \times 2.11 \div 100$, or 6.40 g, or 21.3% of the sample taken.

The data are shown in Table 1.

Unexpectedly wide differences appeared in the extract percentages of the samples of different inheritance—20.9–52.1% on the dry matter basis, and 3.70–17.10% in terms of percentage of stalks. The high result of 52.1% is not new, as the value found by chemists of the Ohio Agricultural Experiment Station (*5*) in the case of the Burr-Leaming variety at maturity was a total sugar content of 35.6% on the dry matter basis, equal to 53.4% of soluble solids on the assumption that the sugars present were equal to two-thirds of the extract.

The extent to which these differences were due to genetic factors is unknown. If inheritance is indeed a controlling factor, an inexpensive method is evidently available for producing high sugar cornstalks: consisting of producing stalks from seed adapted to the locality, and having the property of producing stalks rich in extract at the time when the grain has reached maturity.

[1] Samples were obtained through the courtesy of J. D. Sayre, of the Ohio Agricultural Experiment Station, and were received in Scarsdale, New York, on September 28 by express from Wooster, Ohio. The stalks had been freed from ears, husks, leaves, leaf sheathes, and tassels and carefully packed in moistureproof bags. They were received in excellent condition.

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Phosphates of Pantothenic Acid[1, 2]

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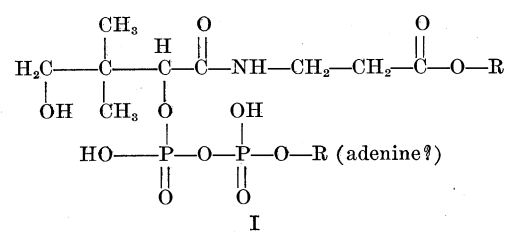
In view of the fact that phosphate derivatives of most B vitamins, rather than the free forms, take part in active biochemical processes and of the fact that both fractions of coenzyme A contain phosphorus (*1*), efforts have been under way for some time in this laboratory to prepare various phosphates of pantothenic acid and to test their biological activities. Recently Lipmann, Novelli, and coworkers have suggested that degradation products encountered during the isolation of coenzyme A may be resynthesized into the coenzyme and hence show acetylation activity *in vitro* in a crude pigeon liver enzyme system. On the basis of this and other work, especially degradation by various enzymes, they have proposed for the coenzyme the partial structure I (*2*):



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