Table II. Effect of emetine on protein, RNA and DNA concentrations of different tissues

	Liver Group A Pair-fed control (6)	Group B Emetine-treated (7)	*t* value	Heart Group A Pair-fed control (6)	Group B Emetine-treated (7)	*t* value	Kidney Group A Pair-fed control (6)	Group B Emetine-treated (7)	*t* value
Protein (g/100 g)	15.30 ±0.60	11.68 ±0.61	4.230	11.73 ±0.32	11.06 ±0.15	1.895	12.02 ±0.12	10.39 ±0.21	6.739
RNA (g/100 g)	3.68 ±0.07	3.77 ±0.07	–	1.26 ±0.05	1.27 ±0.08	–	2.80 ±0.20	3.06 ±0.13	1.09
DNA (g/100 g)	0.450±0.045	0.345±0.006	2.313	0.174±0.006	0.181±0.003	–	0.578±0.017	0.528±0.012	2.403
Protein/RNA (ratio)	4.16 ±0.06	3.11 ±0.18	5.535	9.34 ±0.80	8.90 ±0.51	0.468	4.39 ±0.32	3.44 ±0.26	2.329
Protein/DNA (ratio)	34.15 ±0.98	34.33 ±1.80	–	67.97 ±3.74	61.27 ±1.15	1.71	20.86 ±0.55	19.72 ±0.50	1.532

The figures in the parentheses are the number of animals. The results are means ± S.E.M.

cell size. However, DNA content per 100 g of heart tissue does not change upon treatment suggesting thereby non-impairment in the cardiac cell size. The unaltered cellular protein concentration despite reduced protein synthesis in emetine-treated animals may be explained by the fact that probably diminished breakdown of protein occurs in addition to reduced protein synthesis.

It is further seen that RNA concentration of liver or kidney does not change following emetine treatment, but DNA concentration of liver or kidney is diminished under the same condition and accordingly RNA per unit amount of DNA is increased in liver or kidney after emetine treatment. This suggests, therefore, increased cellular concentration of RNA in liver or kidney of emetine-treated animals. Whether this increased cellular concentration of RNA in liver or kidney following emetine treatment is due to increased synthesis or reduced breakdown of RNA, or due to both, cannot be ascertained from the present studies. But heart tissue, unlike liver and kidney tissues, does not elicit depressed concentration of protein or increased cellular concentration of RNA upon emetine treatment. This differential response of the heart tissue to emetine appears more probable because of the differential ability of various organs to concentrate the drug[10]. GIMBLE et al.[10] have determined the relative concentrations of emetine of various organs and found that the heart muscle concentrates the drug less than other organs do.

Résumé. Le contenu de protéine, de RNA et de DNA dans les tissus de foie, de cœur et de rognon a été étudié chez des rats albinos traités à l'émétine. Le traitement a réduit la concentration de la protéine et du DNA dans le foie et dans le rognon. Dans le cœur, cette concentration ne fut pas altérée d'une manière significative. On suggère que l'émétine non seulement empêche la synthèse de la protéine, mais réduit aussi sa désagrégation.

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Effect of an Inhibitor Isolated from Onion (*Allium cepa* Linn.) Bulbs on the Activity of Some of the Enzymes Involved in Starch Biosynthesis

Most fructosan-bearing plants do not contain starch, so it is possible that some type of inhibitor may be present in these plants which partially or completely inhibits the synthesis of starch. The presence of fructosan was previously noted in onion bulbs (*Allium cepa* Linn.)[1,2]. The observation[3] that juice of onion bulbs inhibits the formation of starch can be explained on the basis of inhibition of one of the enzymes involved in starch biosynthesis and degradation. In the present investigation, an inhibitor was isolated from the bulbs of *A. cepa* Linn. to study its effect on the activity of some of the enzymes of starch biosynthesis.

Material and methods. The inhibitor was isolated by the method employed by HART et al.[4] in the case of garlic bulbs, and its aqueous solution was used in the enzymic studies. Starch phosphorylase was prepared from potatoes by the method of GREEN and STUMF[5]. The reaction mixture consisted of 1. 0.4 ml starch phosphorylase preparation, 2. 0.3 ml of 0.1 *M* citrate buffer (pH 6.1), 3. 0.3 ml of 5% soluble starch solution, 4. 0.9 ml of either double distilled water or inhibitor solution, 5. 0.4 ml of 0.1 *M* glucose-1-phosphate solution. The reaction was carried out at 37 °C for different periods and stopped by the addition of 5 ml of 5% trichloroacetic acid and 2 ml of 2.5% ammonium molybdate in 5 *N* sulfuric acid. The mixtures were diluted to 25 ml with water and the suitable aliquot of the filtrate was analyzed for phosphorus by the method of FISKE and SUBBAROW[6].

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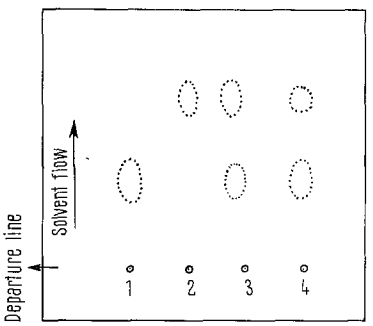
Phosphoglucomutase was prepared from potatoes by the method of RUSSEL[7]. The reaction mixture consisted of 1. 0.4 ml of phosphoglucomutase preparation, 2. 0.2 ml of 0.1 *M* cysteine solution (pH 7.5), 3. 0.2 ml of 0.1 *M* citrate buffer (pH 7.4), 4. 0.3 ml of either double distilled water or inhibitor solution, 5. 0.4 ml of 0.06 *M* glucose-1-phosphate solution. The reaction mixtures were incubated at 37 °C for different periods and the reaction stopped by the addition of 1 ml of 5 *N* sulfuric acid and volume made to 5 ml with distilled water. The reaction tubes were placed in a boiling water-bath for 3 min and the liberated phosphorus was determined by the method of FISKE and SUBBAROW[6]. The incubation mixtures were also subjected to TLC for resolution of sugar phosphates by the method of DAVIDSON and DREW[8].

Effect of inhibitor on phosphoglucomutase activity

Incubation period (min)	Inorganic phosphorous of glucose-6-phosphate formed from glucose-1-phosphate in the reaction mixture (mg)	
	With inhibitor	Without inhibitor
4	0.21	0.20
6	0.20	0.25
8	0.24	0.29
12	0.25	0.35
15	0.25	0.47



Representation of thin layer chromatogram developed by the method of DAVIDSON and DREW[8]. Initial spots at the departure line were 1. glucose-1-phosphate solution; 2. glucose-6-phosphate solution; 3. reaction mixture without inhibitor solution, incubated for 15 min; 4. reaction mixture with inhibitor solution, incubated for 15 min. Faint dotted circles indicate weak spots.

Results. The inhibitor is dialyzable and soluble in water, benzene, chloroform and di-ethyl ether. It can be concentrated by extraction in these solvents, followed by in-vacuo evaporation at low temperature. It did not show any effect on starch phosphorylase activity when incubated up to 10 min. Data reported in the Table and thin layer chromatography analysis (Figure) showed partial inhibition of conversion of glucose-1-phosphate to glucose-6-phosphate when reaction mixtures contained inhibitor solution.

Discussion. Simultaneous occurrence of sucrose[2] and fructosan in onion bulbs presents a dilemma, since known systems for the synthesis of sucrose require glucose-1-phosphate[9] and sucrose is a substrate for fructosan biosynthesis[10,11]. In view of the presence of phosphoglucomutase inhibitor, the alternate pathways may exist in this plant for the synthesis of sucrose from fructose phosphates and UDPG[12–14]. Then the biosynthesis of starch from sucrose may be inhibited owing to the presence of phosphoglucomutase inhibitor, as it is one of the enzymes involved in its synthesis and sucrose is utilized for fructosan biosynthesis. The speculation is also tenable because synthesis of fructosans does not require glucose-1-phosphate.

Zusammenfassung. Aus Zwiebelknollen (*Allium cepa* Linn.) wurde ein Hemmstoff der Phosphoglukomutase isoliert.

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Studies on the Behaviour of Circular Dichroism of Different Haemoglobins in the 260 nm Region

In 1968 we found that complexes of human methaemoglobin and metmyoglobin differ in optical activity in the soret and 260 nm region[1]. The values of ellipticity of the soret region compared with those of the 260 nm region show an opposite tendency: the ellipticity at 260 nm increases with the low-spin character of the complexes while in the soret region the values decrease with increasing low-spin character. We conclude from this finding that there must be different chromophores which produce cotton effects at 260 nm and in the soret region[2]. Moreover, in both regions, significant species-dependent differences are to be observed. From correlations between the affinity of different ligands of haemoglobin (alcylisocyanides) and of methaemoglobin with