ABSTRACTS

Christensen, S.; and Jensen, J. (Dept. of Physiol., Univ. of Aarhus, Aarhus, Denmark): UPTAKE OF LABELLED CHOLESTEROL FROM PLASMA BY AORTIC INTIMA-MEDIA IN CONTROL AND INSULIN-INJECTED RABBITS. J. Atheroscler. Res. 5:258-59, March-April 1965.

The rate of transfer into the arterial wall of cholesterol from plasma seems to be of importance for the development of cholesterol accumulation in the arteries of hyperlipemic animals. Furthermore, the results of various animal experiments have raised the question as to whether insulin promotes arterial atherogenesis. With this background, the uptake of labeled plasma cholesterol by rabbit aortic intima-media was studied under control conditions and following insulin injection. The present approach did not allow detection of any influence of insulin upon the transfer of cholesterol from plasma to arterial wall. W.R.K.

Coffey, R. G.; Cheldelin, Vernon H.; and Newburgh, R. W. (Science Res. Inst., and Dept. Chem. Oregon State University, Corvallis, Ore.): GLUCOSE UTILIZATION BY CHICK EMBRYO HEART HOMOGENATES. J. Gen. Physiol. *48*:105-12, September 1964.

Homogenates of chick hearts and adult chicken hearts were incubated with either glucose-1-C-14 or glucose-6-C-14. The reaction mixtures were fortified with ATP and nicotinamide, but TPN and DPN were not added. The ratio of C-14-O_2 derived from carbon-1 of glucose to that from carbon-6 was approximately five in three-day-old whole embryo homogenates but fell rapidly in the next day or two of growth. Heart homogenates studied at about four days of age had a ratio of approximately 1.5, but the ratio fell to around one by six days of age. Adult chicken heart homogenates had a ratio of about one. The authors conclude that, although the phosphogluconate pathway appears to contribute to an insignificant extent in adult heart tissue, it may play a relatively greater role in the hearts of very young embryos. The degree to which the availability of TPN or DPN in the homogenate may be limiting the rate of reaction in each case is not clear. H.T.N.

Cowan, J. S.; Vranic, M.; and Wrenshall, G. A. (The Banting and Best Dept. of Med. Res., Univ. of Toronto, Toronto, Canada): NUTRITIONAL CONDITIONS AFFECTING THE RATE OF GLUCOSE PRODUCTION IN FED AND FASTING FEMALE DOGS. Metabolism *14*:468-70, April 1965.

The rate of glucose appearance or production was determined in female dogs using a series of measured C-14-glucose tracer injections. The animals were preconditioned with diets high in protein, fat or carbohydrate after which the effects of fasting upon glucose appearance were observed. The initial rates of glucose appearance were higher in carbohydrate-conditioned animals; however, the values obtained after two or three days of fasting did not differ regardless of the nature of the conditioning diet. The rate was higher in four female dogs with Sandmeyer-diabetes and in one dog thirty-five days prepartum. C.R.S.

Fine, J. (Royal Gwent Hosp., Newport, Mon., Wales): GLUCOSE CONTENT OF NORMAL URINE. Brit. Med. J. *1*:1209-14, May 8, 1965.

The glucose content of the urine in 700 adults sixteen to sixty-five years of age (537 males, 163 females) was determined by the Clinistix method and by quantitative method utilizing an enzyme mixture containing buffered glucose oxidase-peroxidase and o-dianisidine. By the quantitative method, glucose was uniformly found in all urine, only 1.6 per cent of the patients being either previously known diabetics or discovered to be diabetic as a result of the testing. Lowest excretion was 0.2 mg. per 100 ml., highest 9,328 mg., with 91 per cent within the range of 1 to 15 mg. Mean excretion was 6 mg. per 100 ml. Of the 9 per cent with glucose contents exceeding 15 mg. per 100 ml., 20 per cent were diabetics and the remainder those with renal or lag glycosuria.

Only a few urines containing 15 mg. per cent or less glucose gave positive results with Clinistix, approximately one half being Clinistix positive in the range of 15 to 40 mg. and at 40 mg. or more Clinistix was consistently positive. The mean glucose excretions were approximately the same for males and females, but a slight rise with increasing age was noted in glucose excretion in both sexes.

In thirty volunteers excluding renal glycosurics, glucose excretion was 32 to 92 mg. in twenty-four hours, mean 65 mg. Rate of glucose excretion was found to be less subject to fluctuation than glucose concentration of urine specimen and showed a distinct fall in nocturnal samples despite raised glucose contents concentration of the overnight specimens. During glucose tolerance testing, an increased rate of glucose excretion was demonstrated as well as increased glucose concentration, indicating that glucose intolerance in terms of urinary-glucose excretion is a normal phenomenon.

It is suggested that the term glycosuria be replaced by the terms "normoglucuria" or "hyperglucuria," the former indicating normal amounts of glucose or 15 mg. or less per 100 ml. R.F.B.

Heald, Felix, P.; Mueller, Peter S.; and Daugela, Mary Z. (Div. of Adolescent Med., Children's Hosp. of the Dist. of Columbia; Dept. of Pediat., Georgetown Univ. Sch. of Med.; and the Lab. of Clin. Sci., National Inst. of Health, Bethesda, Maryland): GLUCOSE AND FREE FATTY ACID METABOLISM IN OBESE ADOLESCENTS. Amer. J. Clin. Nutr. *16*:256-64, February 1965.

Blood glucose and plasma free fatty acid concentrations were determined in six male and six female obese adolescents, age 10-17 yrs., and seven male and seven female control adolescents, age 12-19 yrs., before and during intravenous glucose tolerance test, epinephrine and insulin infusion, and a twenty-four-hour fast. The following slight but statistically significant differences were noted between the obese and control groups:

(1) Slightly lower blood glucose concentration at 240 minutes during the intravenous glucose tolerance test in the obese group; (2) initial mean fasting concentrations of FFA for obese and normal subjects were not significantly different, but were higher than the mean for normal adults; (3) significant delay in FFA response to epinephrine in the obese subject; (4) diminished FFA response to insulin infusion in the obese

subjects without a significant difference in the glucose response to insulin in either group; (5) no significant difference in FFA or glucose response to fasting between the obese and control adolescents.

It is suggested that response of plasma FFA, but not blood glucose to insulin, is diminished in obese adolescents. Evidence is presented for a decreased glycogenolytic response to epinephrine in obese adolescents. R.F.B.

Hellman, L. M.; and Fillisti, L. P. (Dept. of Obstet. and Gynec., State Univ. of N.Y., Downstate Med. Center, and Kings County Hosp., Brooklyn, N.Y.): ANALYSIS OF THE ATROPINE TEST FOR PLACENTAL TRANSFER IN GRAVIDAS WITH TOXEMIA AND DIABETES. Amer. J. Obstet. Gynec. 91:797-808, March 15, 1965.

Verbatim Summary: The atropine test for placental function was applied to twenty-nine gravidas as controls, and to twenty-four pre-eclamptic, three eclamptic, eleven chronically hypertensive, and sixteen diabetic patients. While the percentage of pre-eclamptic and diabetic gravidas showing transfer of atropine to the fetus was less than the controls, the test was not sufficiently precise to serve as an indicator of placental function in any one individual. E.A.W.

Hennes, Allen R.; and Awai, Kozi (Dept. of Med., Wayne State Univ., College of Med., Detroit, Mich.): STUDIES OF INCORPORATION OF RADIOACTIVITY INTO LIPIDS BY HUMAN BLOOD. III. ABNORMAL INCORPORATION OF ACETATE C-14 INTO FATTY ACIDS BY WHOLE BLOOD AND PLATELETS FROM NONKETOTIC INSULIN-DEPENDENT DIABETICS. Metabolism *14*: 487-98, April 1965.

Incorporation of acetate 1-C-14 into discrete fatty acids of whole blood and platelets obtained from nonketotic insulin-dependent diabetic patients was measured. Whole blood from diabetics incorporates less acetate C-14 into fatty acids per 5 ml. whole blood than does blood from controls. The greatest decrease in radioactivity is seen in 16:0 (palmitic acid); decreases are seen also in oleic acid and myristic acid. There was an increase in the percentage of C-14 in the twenty carbon saturated and unsaturated fatty acids. The abnormal patterns of C-14 in fatty acids formed in whole blood of diabetics returns to normal when the fasting blood sugar is normal. Similar changes in fatty acid C-14 incorporation was observed in platelet-rich plasma although the difference from the control group was not significant. However, there was a significant decrease in 14:0 and 16:0 fatty acid and in lauric acid (12:0) in the platelet study which was not corrected when the blood glucose was brought to normal. C.R.S.

Herman, Yaye F.; Canfield, Craig J.; Conrad, Marcel E.; and Herman, Robert H. (Depts. of Veterinary Microbiology, Metabolism and Hematology, Walter Reed Army Inst. of Res., Washington, D.C.; and the Dept. of Biochemistry, Sch. of Med., Univ. of Pennsylvania, Philadelphia, Pa.): THE COMPARISON OF THE 1-C-14-GLUCOSE AND 6-C-14-GLUCOSE METABOLISM OF RETICULOCYTE-RICH AND RETICULOCYTE-POOR HUMAN RED BLOOD CELLS. Metabolism *14*:500-03, April 1965.

The production of C-14-O_2 from 1-C-14 and 6-C-14 glucose was measured using reticulocyte-rich red blood cells obtained from a patient with hemolytic anemia following open-heart surgery in order to evaluate the glycolytic pathways operative in the nucleated red blood cells. The ratios of labeled glucose utilization obtained in the patient's cells were compared with those of a normal donor. The production of significant amounts of C-14-O_2 from 1-C-14-glucose and negligible amounts from 6-C-14 glucose by both preparations indicates that only the pentose phosphate pathway is operative in both reticulocyte-rich and reticulocyte-poor red blood cell preparations. The reticulocytes apparently do not possess a functioning Krebs tricarboxylic acid cycle. C.R.S.

Hill, John B. (Dept. of Pharmacol., Univ. of North Carolina, Sch. of Med., Chapel Hill, N.C.): A METHOD FOR MEASURING DEVIATIONS FROM EQUILIBRIUM OF THE GLUCOSE ANOMERS IN BLOOD. J. Appl. Physiol. 20:749-54, July 1965.

An automated method for demonstrating deviations from equilibrium in a mixture of α- and β-D glucose is described in detail. This depends upon the specificity of glucose oxidase for the β-D-anomer and the ability of alkali to establish the normal equilibrium rapidly. When applying this method to blood drawn continuously from anesthetized dogs, it was found that the anomers in the blood were in equilibrium, and no deviation from this equilibrium was induced by glucagon, epinephrine, or insulin. D.M.G.

Like, A. A.; Steinke, J.; Jones, E. E.; Cahill, G. F. (Dept. of Path. and Med., Peter Bent Brigham Hosp., and Elliott P. Joslin Research Lab., Harvard Medical School; Diabetes Foundation Inc.; Dept. of Zoology and Physiol., Wellesley College, Boston, Mass.): PANCREATIC STUDIES IN MICE WITH SPONTANEOUS DIABETES MELLITUS. Amer. J. Path. *46*:621-44, April 1965.

Verbatim Summary: Hybrid male mice with mild spontaneous diabetes mellitus and associated pancreatic islet cell tumors are reported. Ultrastructural evidence indicating that the tumors are composed of beta cells actively synthesizing and releasing insulin is supported by increased quantities of extractable pancreatic insulin in these mice and the eventual subsidence of the glycosuria. E.A.W.

Lockwood, Dean H.; and Prout, Thaddeus E. (Dept. of Med., The Johns Hopkins Univ., and the Johns Hopkins Hosp., Baltimore, Md.): ANTIGENICITY OF HETEROLOGOUS AND HOMOLOGOUS INSULIN. Metabolism *14*:530-38, April 1965.

Factors governing the relative antigenicity of different insulins in a single species were investigated. Antibody formation to insulin administration was measured by two independent methods. Rabbits injected with either beef or pork crystalline insulin show no differences in antibody responses. Pork and rabbit insulins differ only in the terminal amino acid of the carboxyl end of the B chain. Removal of this amino acid from the pork insulin reduced its antigenicity for the rabbit; two of five animals developed antibody following its administration. Pork insulin given to pigs produced antibody after twelve weeks while pork-NPH and beef insulin resulted in a prompt rise in antibody titers in these animals. The antipork insulin antibody did not distinguish between the various forms of pork insulin and all were bound to a greater degree than the beef insulin. Human subjects treated with crystalline zinc insulins of beef, pork, or pork-modified origin did not develop significant antibody levels after seventeen weeks of daily injection with one exception. The latter individual received beef insulin and manifested a slow rise

beginning at the ninth week. Crystalline insulin was noted to be a poor antigen in the human suggesting that the chemical form of insulin and its rate of absorption are important factors in the antigenicity of injected insulin. C.R.S.

Love, Thomas A.; Sussman, Karl E.; and Timmer, Richard F. (Depts. of Med. and Anat., University of Colorado, Sch. of Med., Denver, Colo.): THE EFFECT OF ADRENOCORTICOTROPHIC HORMONE ON PLASMA INSULIN AND BLOOD GLUCOSE IN THE ADRENALECTOMIZED RAT. Metabolism *14*:632-38, May 1965.

Among the extra-adrenal effects of ACTH are included adipokinesis, melanocyte stimulation, ketosis and hypoglycemia. ACTH was administered to adrenalectomized and sham-operated rats to determine whether ACTH-induced hypoglycemia was associated with increased plasma insulin levels. After ACTH the mean blood glucose of sham-operated rats was 150.2 mg. per 100 ml. The mean blood glucose of adrenalectomized ACTH-treated animals was 93.4 and 77.1 mg. per 100 ml. at fifteen and thirty minutes respectively after injection. Mean plasma insulin levels after ACTH were 42.8 mU./ml. in sham-operated animals, while in the adrenalectomized the levels were 125 mU./ml. and 54.3 mU./ml. at fifteen and thirty minutes respectively. This evidence suggests that ACTH produced hypoglycemia in adrenalectomized animals through an effect upon the pancreas resulting in elevated plasma insulin levels. C.R.S.

Rudnick, P. A.; and Taylor, K. W. (Dept. of Med. and Diabetic Dept., King's Coll. Hosp., London, England, and Univ. of California, L.A. Med. Sch., Los Angeles, Calif.): EFFECT OF PROLONGED CARBOHYDRATE RESTRICTION ON SERUM-INSULIN LEVELS IN MILD DIABETES. Brit. Med. J. *1*:1225-28, May 8, 1965.

Blood glucose and serum insulin determined by an immunoassay procedure were measured fasting and at thirty, sixty, and 120 minutes after the ingestion of 50 grams of glucose in ten healthy, nonobese individuals twenty to thirty-five years of age and in eight patients with mild diabetes selected for treatment with low-calorie diets with marked carbohydrate restriction. Similar studies were also carried out on four patients presenting with marked loss of weight and ketosis and in whom insulin treatment was necessary. In the patients with mild diabetes, studies were repeated at two and four months after dietary restriction. Only two of these patients were initially underweight and the remainder overweight. Carbohydrate intake was ninety to 130 grams per day in the overweight subjects and 150 to 170 grams per day in the underweight.

Fasting serum-insulin values were consistently higher in the diabetics than in normals and were unchanged by treatment. Glucose tolerance tests were consistently improved in seven of the eight diabetics, and despite lower blood glucose levels serum-insulin levels after glucose were higher following dietary treatment, the greatest increase being noted at sixty minutes after glucose. In the diabetic whose glucose tolerance did not improve with diet, fasting-insulin values were higher than the normals and showed almost no response to glucose ingestion both before and after dietary treatment.

It is suggested that the results are due to an improvement in the capacity of the pancreas to secrete insulin following the lowering of blood-glucose levels by diet. R.F.B.

Sacks, William (Res. Facility, Rockland State Hosp., Orangeburg, N.Y.): CEREBRAL METABOLISM OF DOUBLY LABELED GLUCOSE IN HUMANS IN VIVO. J. Appl. Physiol. *20*:117-30, January 1965.

Radioactivity labeled glucose was injected intravenously into human subjects, and arterial and venous blood samples were taken at intervals thereafter and analyzed for lactate, pyruvate and C-14-O_2. Evidence is given for dilution of the specific activity of derivatives of glucose-1-C-14 and glucose-2-C-14 in the Krebs cycle. It is postulated that the Krebs cycle may include a small but metabolically active pool of glutamate, gamma-aminobutyrate and succinic semialdehyde. H.T.N.

Samaan, N.; Brown, J.; Fraser, Russell; and Trayner, I. (Dept. of Med., Postgraduate Med. Sch. of London; Dept. of Chem. Path., Postgraduate Med. Sch. of London, England): EFFECT OF OBESITY AND OF STARVATION ON INSULIN ACTIVITY. Brit. Med. J. *1*:1153-56, May 1, 1965.

Worcester rats were fasted for seven days and aortic blood obtained for "typical" and "atypical" insulin-like activity each day from these and fed control rats. Both "typical" and "atypical" insulin-like activity were lowered to ± 1/3 by the fourth day and to unassayable levels by the seventh day in the fasted rats, the insulin-like activity levels remaining unchanged in the fed controls.

Five nondiabetic, three subclinically diabetic, and four diabetic patients with obesity were studied before and after a seven-day fast by means of free fatty acid, "typical" and "atypical" insulin-like activity, and blood glucose at fasting and at one and two hours after a 50-gram oral glucose load.

Free fatty acids were high in all groups with a subnormal rate of fall after oral glucose, but without any characteristic difference among the three small groups. The "atypical" insulin-like activity seemed to rise with the degree of obesity and "typical" insulin-like activity was also somewhat elevated. In the diabetic group the "typical" insulin-like activity responses to glucose were delayed and very low. In the subclinical diabetic group "typical" insulin-like activity was delayed after glucose. Following the fast, fasting blood glucose levels fell in all groups to normal or subnormal values, but the two-hour values were distinctly elevated in all three groups. The free fatty acids were strikingly higher after fasting both before and after glucose, but the rate of fall after glucose was comparable to that prior to fasting. After the period of fast levels of "atypical" insulin-like activity approximately doubled, the change being about equal in all groups, the percentage rise corresponding roughly with the induced increments in serum free fatty acid. The levels of "typical" insulin-like activity were also approximately doubled in all three groups. The response to glucose was greatest in the nondiabetic obese, but the diabetic response more closely approximated that of the other groups, suggesting that fasting had lessened the demand for insulin more than it had caused increasing insulin resistance resulting from increased fat mobilization. R.F.B.

Shapiro, Alvin P.; Perez-Stable, Eliseo; and Moutsos, Spero E. (Dept. of Med., University of Pittsburgh, Sch. of Med.; and the Presbyterian-Univ. and Pittsburgh Veterans Administration Hosps., Pittsburgh, Pa.): COEXISTENCE OF RENAL ARTERIAL HYPERTENSION AND DIABETES MELLITUS. JAMA *192*: 813-16, June 7, 1965.

This is a study of a group of fifty-five patients with hypertension proven by aortography and autopsy to be associated by renal artery stenosis (33 per cent bilateral). The patients were investigated for diabetes by FBS, glycosuria and, most of them, by glucose tolerance test. Twenty-four (44 per cent) had definite or probable diabetes. The mean age of the group was 52.7 years, with 38 per cent of the diabetic and only 25 per cent of the nondiabetic patients under fifty years of age. Of fifteen patients with renal biopsy during life or at autopsy, three had diabetic nephropathy. Manifestations of severe atherosclerosis in other areas (heart, brain, legs) was present in 63 per cent of the patients. The possible interrelationships between diabetes, hypertension and renal artery stenosis are discussed. S.B.B.

Spellacy, William N.; Goetz, Frederick C.; Greenberg, Beryl Z.; and Ells, Joyce (Depts. of Obstet. and Gynec., and Intern. Med., Univ. of Minnesota Med. Sch., Minneapolis, Minn.): PLASMA INSULIN IN NORMAL MIDPREGNANCY. Amer. J. Obstet. Gynec. 92:11-15, May 1, 1965.

Verbatim Summary: Plasma insulin was measured in normal midpregnancy and again postpartum in a fasting state and after an intravenous glucose stimulus. Hyperinsulinemia was demonstrated in midpregnancy, but it is less marked than that seen in late pregnancy. E.A.W.

Steiner, Donald F.; Younger, Lee; and King, Judith (Dept. Biochem., Univ. of Chicago, Chicago, Ill.): PURIFICATION AND PROPERTIES OF URIDINE DIPHOSPHATE GLUCOSE-GLYCOGEN GLUCOSYLTRANSFERASE FROM RAT LIVER. Biochemistry 4:740-51, April 1965.

Uridine diphosphate glucose-glycogen glucosyltransferase (glucosyltransferase, or glycogen synthetase) of liver is usually found bound to particulate glycogen in homogenates. During brief incubation at 37° in the absence of glucose-6-P the liver enzyme is reversibly inactivated and also is released from the particulate glycogen fraction. The soluble enzyme can be further purified by fractionation with ammonium sulfate, and the activity can be restored by incubation with glucose-6-P and fluoride. Sucrose density gradient studies suggest that reversible inactivation of the enzyme is accompanied by dissociation of the enzyme molecule into smaller units. Stimulation of the enzyme activity by glucose-6-P may be explained at least in part by competition of this effector with uridine diphosphate, an inhibitor of the reaction catalyzed. H.T.N.

Sukowski, Ernest J.; and Alpert, Norman R. (Dept. of Physiol., Univ. of Illinois, Coll. of Med., Chicago, Ill.): ACCUMULATION OF POLYGLUCOSIDES IN ANAEROBIC RAT LIVER. Metabolism 14:726-33, June 1965.

Anaerobiosis in the rat liver resulted in the disappearance of a considerable amount of glycogen with the production of only small amounts of lactate or glucose. Ninety per cent of the missing carbohydrate was recovered as a series of oligoglucosides containing from two to five glucose residues per molecule. These factors are considered to be breakdown products of glycogen and were identified by paper chromatography. Under anaerobiosis, oligoglucoside accumulation was 65 per cent greater than in the presence of air for both rat liver slices and homogenates. C.R.S.

Sweeney, Martin J.; and Ashmore, James (Dept. of Pharmacology, Indiana Univ. Med. Sch., Indianapolis, Ind.): EFFECTS OF ACUTE INSULIN INSUFFICIENCY ON LIVER AND ADIPOSE TISSUE FATTY ACID SYNTHESIS. Metabolism 14:516-22, April 1965.

The incorporation of C-14 from labeled glucose into fatty acid is reduced in liver slices prepared from rats after the injection of anti-insulin serum (AIS). In order to differentiate decreased glucose utilization from a defect in lipogenesis in these observations, the more immediate precursors, acetate and pyruvate, were used to examine the effects of AIS upon hepatic fatty acid synthesis. Insulin deficiency of 1.5 to 3 hrs. duration was found to reduce the incorporation of C-14 from labeled acetate or pyruvate into fatty acid in liver slices. AIS caused a further depression of lipogenesis in the livers of hypophysectomized rats. However, fatty acid synthesis in adipose tissue using C-14-labeled pyruvate was not influenced by prior treatment with AIS. C.R.S.

Tomizawa, Henry H.; and Varandani, P. T. (The Fels Res. Inst., Yellow Springs, Ohio): GLUTATHIONE-INSULIN TRANSHYDROGENASE OF HUMAN LIVER. J. Biol. Chem. 240:3191-94, July 1965.

Beef liver contains an enzyme, designated glutathione-insulin transhydrogenase, which catalyzes the cleavage of insulin at the disulphide linkages by simple sulfhydryl compounds such as glutathione. Since it has been suggested that the B chain of insulin may be the synalbumin antagonist of Vallance-Owen, the presence of this insulin-splitting enzyme was sought in human livers. It was found in large amounts and had properties similar to those of the bovine enzyme. No differences were detected between enzyme activity of diabetic and nondiabetic subjects. D.M.G.

Van Steveninck, J.; and Booij, H. L. (Lab. of Med. Chem., Leyden, Netherlands): THE ROLE OF POLYPHOSPHATES IN THE TRANSPORT MECHANISM OF GLUCOSE IN YEAST CELLS. J. Gen. Physiol. 48:43-60, September 1964.

Uranyl (UO_2^{++}), nickel (Ni^{++}) and cobalt (Co^{++}) ions are bound to yeast cells to a similar extent. Binding appears to occur at the cell surface, and these ions compete with each other for binding. Yeast cells that have been grown in phosphate-deficient medium exhibit a decreased amount of total phosphate in the cells, and bind much less of these cations. Under various experimental conditions the degree of binding of uranyl ions parallels the changes in polyphosphate content of the cells. Since polyphosphates can bind these ions, it is postulated that polyphosphates at the surface of the yeast cells are responsible for the cation binding observed. Uranyl ions inhibit glucose uptake by yeast cells. Conversely, glucose decreases the binding of Ni^{++} and Co^{++}. It is suggested that in yeast cells glucose uptake involves some kind of interaction between glucose and polyphosphate at the cell surface. The binding of thorium ions differs from that of uranyl ions in a manner that suggests that additional binding sites are involved. Evidence is presented that suggests that a phosphatide group such as lecithin, in addition to polyphosphates, might be important for the binding of thorium ions. It is pointed out that similar transport mechanisms may not apply to red blood cells and other cells that do not contain polyphosphate. H.T.N.