ABSTRACTS

Adam, Peter A. J.; King, Katherine; and Schwartz, Robert (Dept. of Pediat., Case Western Reserve Univ. Sch. of Med., Cleveland; and Cleveland Metropolitan Gen. Hosp., Cleveland, Ohio): MODEL FOR THE INVESTIGATION OF INTRACTABLE HYPOGLYCEMIA: INSULIN-GLUCOSE INTERRELATIONSHIPS DURING STEADY STATE INFUSIONS. Pediatrics. *41*:91-105, January 1968.

Plasma glucose and insulin responses to continuous four-hour infusions of glucose were evaluated in seven normal adults, four normal infants, five children with untreated diabetes and four infants with intractable hypoglycemia. Infusion rates were increased in step-wise fashion at hourly intervals from 2 mg. per kilogram body weight per minute initially to 4, 6 and eventually 12 mg. Throughout the infusion and during the two-hour period thereafter, plasma samples were obtained at frequent intervals. In normal adults and infants the pattern of glucose and insulin responses were similar, although the normal infants appeared to dispose of the glucose load more rapidly. Insulin responses among the diabetic patients were subnormal relative to glucose levels at all times. The hypoglycemic infants had one of two patterns: (1) higher plasma insulin levels than control subjects when plasma glucose was low; (2) low insulin levels at all concentrations of plasma glucose similar to the diabetic infants. In the first category hyperinsulinemia appeared to be the chief cause of the hypoglycemia and in the second category, inappropriate hepatic mobilization of glucose. R.K.K.

Brolin, Sven E.; and Berne, Christian (Histological Dept., Univ. of Uppsala, Uppsala, Sweden): THE ENZYMATIC ACTIVITIES OF THE INITIAL GLYCOLYTIC STEPS IN PANCREATIC ISLETS AND ACINI. Metabolism *16*:1024-28, November 1967.

In the pancreas of New Zealand obese mice, the islets of which exhibit hyperactivity, enzymatic activities were found to be significantly higher in islets than in the acini with particular reference to those enzymes involved in the glycolytic formation of glyceraldehyde-3-phosphate. The activity of glycerophosphate dehydrogenase is reduced in islet tissue compared to acinar tissue. Thus the glycolytic pathways leading to formation of ATP are favored over those leading to fat metabolism in islet tissue. C.R.S.

Clarke, B. F.; and Duncan, L. J. P. (Diabetic and Dietetic Dept., Royal Infirmary, Edinburgh, Scotland): COMPARISON OF CHLORPROPAMIDE AND METFORMIN TREATMENT ON WEIGHT AND BLOOD-GLUCOSE RESPONSE OF UNCONTROLLED OBESE DIABETICS. Lancet *1*:123-26, Jan. 20, 1968.

There has been an impression that obese diabetics treated with sulfonylureas tend to gain weight whereas those treated with diguanides tend to lose weight. The effects of chlorpropamide and metformin on body weight and blood glucose were compared in a prospective, controlled, cross-over study. Seventy-seven obese diabetics, predominantly female, were treated with each of the drugs for twelve-month periods. The study periods were preceded by periods of dietary management alone. Most patients gained weight while receiving chlorpropamide (mean gain: 11.6 lb. per twelve months) and lost weight while taking metformin (mean loss: 2.7 lb. per twelve months). The differences between the weight changes during the two forms of drug therapy were highly significant, but the control of blood sugar by each of the drugs was comparable. Although the mechanisms responsible for these changes in weight are not clear, it is recommended that diguanide therapy be considered for the obese diabetic uncontrolled by diet alone. T.G.S.

Flores, Placido; and Schedl, Harold P. (Gastroenterology Res. Lab., Dept. of Intern. Med., Univ. of Iowa, Iowa City, Ia.): INTESTINAL TRANSPORT OF 3-O-METHYL-D-GLUCOSE IN THE NORMAL AND ALLOXAN-DIABETIC RAT. Amer. J. Physiol. *214*:725-29, April 1968.

Verbatim Summary. We studied small intestinal transport of 3-o-methyl-D-glucose in everted sacs and by circulating in situ segments in normal and diabetic rats. In circulation studies absorption was determined from net H_2O movement and loss of intraluminal 3-o-MG. In sac studies net H_2O movement and 3-o-MG concentration in serosal fluid (S), mucosal fluid (M), and tissue H_2O (T) were measured. The initial 3-o-MG concentration was 1 mM in S and M, and after one hour of incubation S/M was 2.2 in normal and 4.5 in diabetic rats. T/M was 2.7 in normal and 5.9 in diabetic rats. Net 3-o-MG movement was three times greater in diabetic than in normal rats and followed the increase in S/M and T/M gradients. Since T/S was 1.2 in normal and 1.3 in diabetic rats, the increased transintestinal movement of 3-o-MG in sacs from diabetic rats could be explained by increased tissue uptake. In an attempt to explain the increased uptake, the following observations were made: (a) addition of insulin did not change significantly 3-o-MG transport in sacs from diabetic rats; (b) addition of glucose to S of sacs from normal rats increased transport slightly, but significantly; (c) addition of glucose to S and M of sacs from normal rats caused net movement of 3-o-MG from S to M; (d) 3-o-MG absorption from in situ segments was also significantly increased in diabetic rats, but only by 20 per cent. Our findings suggest that hexose transport in diabetic rats does not depend directly on glucose metabolism and cannot be explained by an increased intestinal glucose pool. Because of defective glucose metabolism the energy for increased hexose transport in diabetes must arise from other metabolic pathways.

Floyd, John, C., Jr.; Fajans, Stefan, S.; Conn, Jerome, W.; Thiffault, Charles; Knopf, Ralph, F.; and Guntsche, Enrique (Dept. of Intern. Med. Div. of Endocr. and Metabolism and the Metabolic Res. Unit, The Univ. of Michigan, Ann Arbor, Mich.): SECRETION OF INSULIN INDUCED BY AMINO ACIDS AND GLUCOSE IN DIABETES MELLITUS. J. Clin. Endocr. *28*:266-76, February 1968.

Healthy individuals and patients with subclinical (positive cortisone-glucose tolerance test) and mild maturity-onset diabetes were infused with hypoglycemic amino acids. Each group consisted of eighteen or more individuals. Nearly identical responses were obtained with a mixture of ten amino acids (0.41 gm./kg.) or arginine alone (0.41 gm./kg.). A rise in plasma insulin concentration was observed in each

case, but overtly diabetic subjects showed less of an increment than individuals with subclinical diabetes. The latter, in turn, had lower insulin levels than the normal controls. A similarly graded response was also observed following an oral glucose tolerance test. Blood sugar profiles were similar in both the normal individuals and patients with subclinical diabetes, indicating that peripheral resistance to insulin was not a factor in the early phases of the disease. It was concluded that functional impairment of the islet cells was dominant in the early stages of diabetes. O.V.S.

Frasier, S. Douglas; and Kogut, Maurice D. (Pacific State Hosp., Pomona, Calif.; Dept. of Pediat., Sch. of Med., U.C.L.A. Center for the Health Sciences; Dept. of Pediat., The Children's Hosp.; and the Univ. of Southern California, Sch. of Med., Los Angeles, Calif.): ADOLESCENT ACROMEGALY: STUDIES OF GROWTH-HORMONE AND INSULIN METABOLISM. J. Pediat. *71*:832-39, December 1967.

Verbatim Summary. Growth-hormone and insulin metabolism have been studied in a seventeen and one-half-year-old boy with acromegalic gigantism secondary to a chromophobe adenoma of the pituitary. The concentration of serum growth hormone was markedly elevated; there was considerable variability in the concentration from day to day, which was not related to hyperglycemia or hypoglycemia. Following surgical therapy, serum growth hormone was undetectable. The insulin response to glucose loading was elevated and prolonged prior to treatment, and this abnormality persisted following surgery.

Gold, Hugo; Spector, Samuel; Samaan, Naguib A.; and Pearson, Olof H. (Dept. of Pediat. and Med., Western Reserve Univ. Sch. of Med., Cleveland. Ohio): EFFECT OF GROWTH HORMONE ON CARBOHYDRATE METABOLISM IN HYPOPITUITARY DWARFS. Metabolism *17*:74-83, January, 1968.

Abnormal glucose tolerance curves were detected in eight of fifteen dwarfs of the idiopathic growth-hormone deficient type. Six of these have received long-term courses of human growth hormone (HGH) during which they demonstrated good growth responses and improvement in glucose tolerance. In three subjects low serum insulin levels were demonstrated prior to therapy with an increase resulting from HGH administration. Three other untreated dwarfs showed low insulin response to oral glucose. In patients receiving long-term HGH therapy the enhanced insulin responsiveness has persisted and tended to remain normal even after one month of withdrawal of HGH. The increased insulin production may be essential for growth since both insulin and growth hormone are required for protein synthesis. It is possible that growth hormone has a pancreatrophic effect since its administration leads to improved glucose tolerance and insulin response. C.R.S.

Goodridge, Alan G. (Dept. of Physiol., Univ. of Kansas Med. Center, Kansas City, Kans.): METABOLISM OF GLUCOSE-U-C-14 IN VITRO IN ADIPOSE TISSUE FROM EMBRYONIC AND GROWING CHICKS. Amer. J. Physiol. *214*:897-901, April 1968.

Verbatim Summary. The effects of glucagon and insulin on the incorporation of glucose U-C-14 into CO_2, glycogen, glyceride-glycerol, and fatty acids were studied in vitro in adipose tissue from chick embryos and growing chicks. In tissue from seven to eight-day chicks, glucagon slightly inhibited glucose oxidation and markedly inhibited glycogen, glyceride-glycerol, and fatty acid synthesis. Insulin plus glucagon inhibited much more than glucagon alone. Insulin alone slightly increased all rates. Less striking effects were observed in tissue from fifteen to eighteen-day embryos and twenty-eight-day chicks. Inhibition of glucose metabolism was associated with and may have been caused by elevated tissue free fatty acid concentrations. All pathways were more active in seven to eight-day chick tissue than in embryonic tissue. The difference for fatty acid synthesis was fourteen-fold suggesting a possible relationship to the abrupt increase in dietary carbohydrate which occurs after hatching. Fatty acid synthesis in tissue from seven to eight-day chicks was still less than 5 per cent of that in young rat adipose tissue indicating that adipose tissue may not be an important site for lipogenesis in the chick.

Graff, Edward S.; Petti, Mario; and Tramuta, Anthony (Boro Med. Center, Downstate Med. Sch., Brooklyn, N. Y.): DETECTION OF OCCULT DIABETES IN ADVANCED AGE GROUPS. Geriatrics *23*:141-43, February 1968.

Ambulatory outpatients, 911 in number, were given a standard 100 gm. carbohydrate meal, and blood sugars were determined before and after two hours. Elevated blood sugar levels, above the upper normal limit of 120 mg. per 100 ml., were found in 172 patients, and thirty-one were glycosuric. The highest number of positive tests was found in patients who were older than sixty-five years, and the lowest number of positive tests was found in young adults. The authors concluded that the two-hour postprandial blood sugar test is a simple and valuable screening procedure for diabetes. O.V.S.

Kogut, Maurice D.; and Landing, Benjamin H. (Clin. Pathological Conference, Depts. of Metabolism and Path., Children's Hosp., Los Angeles, Calif.): COMA AND HYPERGLYCEMIA IN THE ABSENCE OF KETONEMIA. Amer. J. Dis. Child. *114*:676-83, December 1967.

Nonketotic hyperglycemic coma is described in a twelve-year-old boy. Autopsy findings in this patient as well as the clinical aspects of this condition are reviewed with particular reference to its association with pancreatitis. R.K.K.

Kolodny, Howard D.; and Sherman, Lawrence (Endocr. Sect., Dept. of Med., Long Island Jewish Hosp., Queens Hosp. Center Affiliation, Jamaica, N.Y.): HYPERGLYCEMIC NONKETOTIC COMA IN INSULIN-DEPENDENT DIABETES MELLITUS. JAMA *203*:461-63, Feb. 12, 1968.

The authors describe the unusual occurrence of hyperglycemic nonketotic coma in an insulin-dependent juvenile diabetic (twenty-two years of age, eleven years of diabetes) precipitated by acute diarrhea. The patient had had diabetic ketoacidosis during a previous attack of appendicitis. The amelioration of the ketotic reponse was attributed to an intervening stalk section of the pituitary gland for therapy of diabetic retinopathy. The authors discuss in detail the physiological implications of the specific reduction of tendency to ketoacidosis of the removal of the anterior pituitary gland and the decrease in adrenal activity. S.B.B.

Levine, Rachmiel (Dept. of Med., New York Med. Coll., New York, N.Y.): INSULIN—THE BIOGRAPHY OF A SMALL PROTEIN. New Eng. J. Med. *277*:1059-64, Nov. 16, 1967.

A review of insulin from its formation in the beta cell to

its catabolism in the tissues. Emphasis is placed on factors surrounding the birth of the insulin molecule, its early life within its native cell and physiologic conditions that attend its release into the blood and its final degradation in the tissues. Proposed molecular mechanisms of insulin action and existing conflict of thought prevailing about these mechanisms also are presented. The author champions a unitary theory of insulin action by which the insulin molecule, joined to its specific receptor at or in the membrane, leads to a perturbation of its structure and then to a series of biochemical signals from glucose transport activation to the enhancement of protein synthetic activity. B.R.B.

Levy, Daniel; and Carpenter, Frederick H. (Dept. of Biochem., Univ. of California, Berkeley, Calif.): THE SYNTHESIS OF TRIAMINOACYL-INSULIN AND THE USE OF THE *t*-BUTYL-OXYCARBONYL GROUP FOR THE REVERSIBLE BLOCKING OF THE AMINO GROUPS OF INSULIN. Biochemistry 6:3559-68, November 1967.

Native beef insulin has a terminal α-amino group on the A chain and B chain and an ε-amino group on the lysine residue at position 29 of the B chain. By a series of specific chemical reactions, an amino acid residue (alanine, methionine, asparagine, lysine or glutamic acid) was added to each of the three amino groups of insulin. The products were characterized by amino acid analysis, chromatography of the insulin derivatives on DEAE Sephadex, and by chemical and enzymatic degradations. The triaminoacyl-insulins all possessed approximately 40 to 50 per cent of the biological activity of native bovine insulin when tested by the mouse convulsion assay; the substituted insulins had slightly more than 50 per cent of the reactivity of native insulin in immunoassays. H.T.N.

Lowy, Clara; and Schiff, D. (Nuffield Neonatal Res. Unit, Hammersmith Hosp., London, Eng.): URINARY EXCRETION OF INSULIN IN THE HEALTHY NEWBORN. Lancet 1:225-27, Feb. 3, 1968.

In the first few days of life the healthy newborn infant has low blood glucose levels and decreased glucose tolerance. During this period glucose utilization is very important and in order to study it, knowledge of insulin secretion is essential. Measurement of random or postglucose insulin levels may not necessarily reflect insulin secretion. Since urinary excretion of insulin has been shown to reflect blood insulin, this parameter was studied in forty-five normal full term healthy male infants during the first five days of life. On the first day, urinary insulin averaged 3.10 μU./hr. in twenty infants who were not fed. This value was no different from fifteen bottle fed and ten breast fed infants. On the fifth day, urinary insulin increased to 19.9 and 22.6 μU./hr. in breast fed and bottle fed infants, respectively. Insulin excretion was independent of renal function and its six-fold increase supports the view that the improvement in glucose tolerance during the first week of life is due to increased insulin secretion. T.G.S.

Lundquist, Ingmar; and Rerup, Claus (Dept. of Pharmacol., The Royal Univ., Lund, Sweden): BLOOD GLUCOSE LEVEL IN MICE. 3. ON THE NATURE OF CORTICOTROPHIN INDUCED HYPOGLYCAEMIA. Acta Endocr. 56:713-25, December 1967.

Verbatim Summary. The hypoglycemic effect of synthetic tetraicosapeptide corticotrophin was investigated in NMRI mice in order to determine its physiological significance as well as its mechanism of action. In normal nonfasting mice corticotrophin produced a maximal hypoglycemic response at a dose level of about 5 μg. per 20 gm. mouse (1,250 mU. per 20 gm. mouse). The ED_{50} of the hypoglycemic effect was about 1,000 times larger than the ED_{50} for adrenal cortical stimulation. Immunoassayable insulin was markedly increased fifteen minutes following 5 μg. of cortocotrophin, whereas following a maximal steroidogenic dose (1.6 nanogram) or following either stress the plasma insulin levels were normal. In adrenalectomized mice the administration of 5 μg. of cortocotrophin had practically no effect on the blood glucose level, whereas pretreatment with a glucocorticosteroid in adrenalectomized mice markedly restored the hypoglycemic response. Acutely hypophysectomized mice showed a hypoglycemic response to corticotrophin indistinguishable from that in normal mice, whereas animals hypophysectomized three to seven days before corticotrophin injection showed a smaller response.

Corticotrophin in a dose of 5 μg. per 20 gm. mouse had no hypoglycemic effect in mice with manifest alloxan diabetes. Corticotrophin injected five minutes following a diabetogenic dose of alloxan had hardly any measurable effect on the acute initial alloxan hyperglycemia, whereas the latter was greatly reduced when corticotrophin was given five minutes before alloxan administration. Pretreatment with corticotrophin did not change the frequency or intensity of the ensuing diabetic condition in mice.

It is concluded that the corticotrophin induced hypoglycemia is dependent on (1) the presence of normally functioning pancreatic beta cells, and (2) the presence of glucocorticosteroids. It is doubtful whether the observed hypoglycemia has any physiological significance.

MacGillivary, Margaret H.; Aceto, Thomas, Jr.; and Frohman, Lawrence, A. (Depts. of Pediat. and Med., State Univ. of New York at Buffalo Sch. of Med., Buffalo, N.Y.): PLASMA GROWTH HORMONE RESPONSES AND GROWTH RETARDATION OF HYPOTHYROIDISM. Amer. J. Dis. Child. 115:273-76, February 1968.

Plasma immunoreactive growth hormone (HGH) was measured in eight hypothyroid children following insulin-induced hypoglycemia and intravenous arginine infusions. All patients demonstrated significant growth retardation, and six of the eight children had subnormal HGH responses during these procedures. Of these six, four were re-evaluated three to ten months after instituting thyroid therapy. Despite clinical and laboratory evidence of euthyroidism and accelerated growth, three children continued to have subnormal increments of plasma HGH after arginine or induced hypoglycemia, whereas one child responded normally. The authors conclude that restoration of euthyroidism may precede correction of defective plasma HGH responses in some instances. R.K.K.

McLean, Patricia; Brown, J.; Walters, Eileen; and Greenslade, K. (Courtauld Inst. of Biochemistry, The Middlesex Hosp. Med. Sch., London, England, and Dept. of Med., Univ. of California, Los Angeles, Calif.): EFFECT OF ALLOXAN-DIABETES ON MULTIPLE FORMS OF HEXOKINASE IN ADIPOSE TISSUE AND LUNG. Biochem. J. 105:1301-05, December 1967.

Hexokinases of Types I and II were estimated in an insulin sensitive (adipose tissue) and insensitive (lung) tissue of

the normal and alloxan diabetic rat. In adipose tissue, diabetes induced a small but significant increase in Type I hexokinase and a marked fall in Type II. In lung, there was no significant change in total hexokinase (Types I, II and III) after administration of alloxan and no change in their relative proportions. It was concluded that this evidence supports the hypothesis that the insulin sensitivity of a tissue is related with its content of Type II hexokinase. P.H.W.

Machlin, L. J.; Horino, M.; Hertelendy, F.; and Kipnis, D. M. (Monsanto Company and Dept. of Med., Washington Univ. Sch. of Med., St. Louis, Mo.): PLASMA GROWTH HORMONE AND INSULIN LEVELS IN THE PIG. Endocrinology 82:369-76, February 1968.

Intravenous administration of insulin, starvation, and a rapid decline in blood glucose following an IV infusion of glucose resulted in sluggish and minimal changes in plasma levels of growth hormone (GH) in the pig in contrast to the rather striking changes produced in many by these procedures. Stress and exercise causes significant rises in GH but injection of epinephrine had no effect on plasma GH. The injection of porcine GH into the pig resulted in an initial fall in plasma free fatty acids (FFA) followed by a three to five-fold rise sixty to ninety minutes later. GH disappeared from plasma with a half-time of twenty to thirty minutes and distributed in a volume equal to fifteen to 18 per cent body weight. The GH secretion in a 50 kg. pig was estimated at 2 mg./day. Insulin levels in the pig were 11.0 μU./ml. decreasing to 5.8 μU./ml. after a three-day fast. The increase in plasma insulin following intravenous glucose was quite small and glucose disappearance rates were comparable to those observed in diabetic human subjects. Apparently obesity in the pig is not the consequence of insulin hypersecretion. C.R.S.

Malaisse, Willy J.; Lea, Michael A.; and Malaisse-Lagae, Francine (Dept. of Pharmacol., Indiana Univ. Sch. of Med., Indianapolis, Ind.): THE EFFECT OF MANNOHEPTULOSE ON THE PHOSPHORYLATION OF GLUCOSE AND THE SECRETION OF INSULIN BY ISLETS OF LANGERHANS. Metabolism 17:126-32, February 1968.

Glucose continues to stimulate the secretion of insulin in pancreatic tissue in vitro despite the addition of phloridzin and 3-o-methylglucose to the incubation media. These observations indicate that beta cells are freely permeable to glucose. Insulin secretion is markedly inhibited in the presence of d-glucosamine or mannoheptulose. The inhibitory effect of mannoheptulose is reversible with characteristics of competitive inhibition mediated through the suppression of phosphorylation of glucose. Phosphorylation of glucose is a necessary step in the stimulation of insulin secretion by this sugar. C.R.S.

Mintz, Daniel H.; Stock, Richard; Finster, Joseph L.; and Taylor, Andrew L. (Depts. of Med. and Obstet. and Gynec., Univ. of Pittsburgh Sch. of Med., Magee-Women's Hosp., Pittsburgh, Pa.): THE EFFECT OF NORMAL AND DIABETIC PREGNANCIES ON GROWTH HORMONE RESPONSES TO HYPOGLYCEMIA. Metabolism 17:54-61, January 1968.

Plasma growth hormone (HGH) levels were measured following intravenous insulin administration to normal and insulin dependent juvenile diabetic patients during pregnancy and serially in the postpartum period. HGH responses were suppressed in both groups antepartum. Normal patients exhibited a gradual reappearance of HGH responsiveness following delivery. In contrast, the diabetic subjects demonstrated an early return in HGH response to IV insulin which was correlated with the return to prepregnancy insulin requirements. The diabetic patients appear to have a diminished HGH counteraction of hypoglycemic effects of insulin thereby resulting in enhancement of insulin sensitivity. C.R.S.

The National Center for Health Statistics. Vital and Health Statistics: Characteristics of Persons With Diabetes: United States, July 1964-June 1965 (PHS Publication No. 1000, Series 10, No. 40), 48 pp. U.S. Department of Health, Education, and Welfare, Washington, D.C. 1967.

Verbatim Summary. For the year ending June 1965, it is estimated that about 2.4 million persons, or 1.3 per cent of the civilian, noninstitutional U. S. population, were known diabetics. This and other statistics on the prevalence of diabetics and the socioeconomic and health characteristics of diabetics are presented in a new report from the National Center for Health Statistics based on data collected in the Health Interview Survey.

In general, the reported prevalence of diabetes was higher among females than among males, and in both sexes increased with age, reaching a peak in the 65-74-yr. age group where the rate was 60.6 per 1,000 population for females and 47.1 for males. The median age of diabetics was more than twice that of the total population. While the rates of disability for diabetics were roughly three times those for the total population, much of the disability was attributed to conditions other than diabetes: the majority of diabetics and at least one chronic condition in addition to diabetes. Findings on the limitation of activity and mobility of diabetics, diabetic symptoms, and on disability of diabetics compared with the total population are discussed as are data on medical care, medication, and diet therapy.

Numerous text tables and several charts are provided. Detailed tables present statistics on number and per cent distribution of diabetics by age, sex, color, marital status, family income, and education. Background data on survey design and methodology, definition of terms, and description of chronic conditions are covered in four appendices.

Copies may be purchased for 35¢ from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Perley, Michael J.; and Kipnis, David M. (Dept. of Med., Washington Univ. Sch. of Med., St. Louis, Mo.): PLASMA INSULIN RESPONSES TO ORAL AND INTRAVENOUS GLUCOSE: STUDIES IN NORMAL AND DIABETIC SUBJECTS. J. Clin. Invest. 46:1954-62, December 1967.

Verbatim Summary. The plasma insulin responses of normal-weight and obese, diabetic, and nondiabetic subjects to intravenous glucose was only 30-40 per cent of that seen after oral glucose, indicating that alimentary mechanism(s) in addition to the arterial blood sugar concentration regulate insulin secretion. Observations made in subjects with diverted portal circulation indicate that the alimentary insulinogenic mechanism is located in the intestinal tract. The insulinogenic potency of the alimentary and glycemic stimuli expressed in terms of insulin secretion per gram of glucose were remarkably similar within each group of individuals. Between these groups, however, there were considerable differences.

Obesity, with or without associated diabetes, was associated with a true hypersecretory responsiveness, whereas diabetes was characterized, with or without obesity, by a marked impairment in insulin secretion. The experimental design used in these studies permitted quantitation of the magnitude of the glycemic component of an oral glucose load. As a consequence of impaired insulin secretion, a greater than normal proportion of the oral glucose load escapes initial hepatic extraction in the maturity-onset diabetic and enters the peripheral circulation. Therefore, in the noninsulin-requiring maturity-onset diabetic, the glycemic insulinogenic stimulus for a given oral glucose load is significantly greater than in normal subjects and accounts for the excessive plasma insulin responses observed late in the course of an oral glucose tolerance test.

Pinter, E. J.; and Pattee, C. J. (Clin. Investigation Unit, Queen Mary Veterans Hosp., Montreal, Canada): GLUCOSE AND SERUM-TRIGLYCERIDES. Lancet 2:1205, Dec. 2, 1967.

In this study the relationship of effective glucose utilization on plasma free fatty acid (FFA) concentration, FFA pool size and FFA release from adipose tissue was estimated by serial measurements of plasma specific activity of radioactive albumin-bound palmitic acid. It was found that an infusion of glucose of 225 mg. per minute lowered FFA by 35-40 per cent after ten minutes and that this decrease was due to a 55-70 per cent decrement in FFA release by adipose tissue. The result is consistent with the hypothesis that effective insulin related glucose uptake reduces FFA available to the liver for synthesis of triglycerides. If excessive FFA were made available to the liver, a result of epinephrine related stress, increased hepatic output of lipoproteins could result. T.G.S.

Ray, B. S.; Pazianos, A. G.; Greenberg, E.; Peretz, W. L.; and McLean, J. M. (Dept. of Surg. and Ophthalmology, New York Hosp.-Cornell Med. Center, New York, N.Y.; Div. of Clin. Investigation, Sloan-Kettering Inst.; and Dept. of Med., Memorial Hosp. for Cancer and Allied Diseases, New York, N.Y.): PITUITARY ABLATION FOR DIABETIC RETINOPATHY. I. RESULTS OF HYPOPHYSECTOMY (A TEN-YEAR EVALUATION). JAMA 203:79-84, Jan. 8, 1968.

The authors report on the results of hypophysectomy through a transfrontal octaniotomy in fifty-six patients, over a total period of ten years for treatment of diabetic retinopathy. No deaths occurred among the last thirty-eight patients (since August 1961) whose selection was made on more rigid criteria. The vision was improved in 78.7 per cent of the thirty-seven patients whose follow-up was adequate. No progression of neuropathy, uropathy or peripheral vascular complications was noted over three to seven years after operation. There were no important complications related to the surgery. S.B.B.

Stock, Michael; and Beigelman, Paul M. (Dept. of Med., Univ. of Southern California School of Med., Los Angeles, Calif.): THE EFFECT OF RAT DIET AND WEIGHT UPON RAT EPIDIDYMAL ADIPOSE TISSUE AND METABOLISM. Metabolism 16:1158-63, December 1967.

Simultaneous measurement of glucose uptake, CO-2 production and lipid synthesis in rat epididymal adipose tissue indicated a close correspondence between the metabolic activity of the tissue and the response of these three variables. All three show a significant dose-response relationship over a wide range of insulin concentrations in the incubating medium. Sensitivity to insulin diminished as rat size and age increased. Sensitivity of fat tissue metabolism to insulin was increased somewhat by utilizing a fat-free diet; however, lipid synthesis at higher insulin concentrations was significantly elevated in adipose tissue from rats fed low-fat diets. An insulin-sensitive mechanism may operate specifically in the regulation of lipid production from glucose. C.R.S.

Swislocki, Norbert I. (Div. of Endocr., Sloan-Kettering Inst. for Cancer Res., New York, N.Y.): EFFECTS OF NUTRITIONAL STATUS AND THE PITUITARY ON THE ACUTE PLASMA FREE FATTY ACID AND GLUCOSE RESPONSES OF RATS TO GROWTH HORMONE ADMINISTRATION. Metabolism 17:174-80, February 1968.

Bovine growth hormone (BGH) administered to hypophysectomized fasted rats caused a drop in FFA and plasma glucose. At higher doses of BGH these rats developed a secondary, delayed hyperlipemic effect although the hypoglycemic effect persisted. Hypophysectomized fed rats exhibited only a hypoglycemic response to BGH without an alteration in FFA levels. Normal rats, either fed or fasted, showed no effect in FFA or glucose levels after BGH. The effects of hypophysectomy and fasting were shown also to be functions of the preparation of hormone employed. C.R.S.

Turtle, John R.; and Kipnis, David M. (Metabolism Div., Dept. of Med., Washington Univ. Sch. of Med., St.. Louis, Mo.): A NEW ASSAY FOR ADENOSINE 3',5'-CYCLIC MONOPHOSPHATE IN TISSUE. Biochemistry 6:3970-76, December 1967.

A highly sensitive assay for adenosine 3',5'-cyclic monophosphate (cyclic AMP) has been developed. The procedure involves extraction of a tissue sample with trichloroacetic acid, separation of cyclic AMP from other adenine nucleotides by thin layer chromatography, specific enzymatic conversion of the cyclic AMP to adenosine 5'-monophosphate, and equilibration of the product with radioactive ATP (labeled in the gamma phosphorus with ^{32}P) in the presence of myokinase to yield radioactively labeled ADP. A standard curve can be constructed to indicate the amount of labeled ADP formed from known amounts of cyclic AMP under the conditions employed. Levels of cyclic AMP measured by this procedure in rat liver, skeletal muscle and adipose tissue agree well with values reported by other workers. H.T.N.

Wales, John K.; Grant, Alison: and Wolff, Frederick W. (The Res. Foundation of the Washington Hosp. Center and Dept. of Med., George Washington Univ., Washington, D.C.): STUDIES ON THE HYPERGLYCEMIC EFFECTS OF NONTHIAZIDE DIURETICS. J. Pharmacol. Exp. Ther. 159:229-35, January 1968.

Hypoglycemia in humans due to diuretics is more common than generally suspected. Furosemide and triamterene were markedly hyperglycemic in rats, chlorthalidone, ethacrynic acid and Bayer 1,500 were mildly so. Rise in blood sugar failed to correlate with diuretic effects. Ethacrynic acid inhibits mitochondrial oxidation and phosphorylation and reacts with sulfydryl groups. Furosemide, chlorthalidone and Bayer 1,500, like thiazide diuretics, possess sulfamyl substitution. The diabetogenic property is not due to potassium loss. A.R.C., JR.