BOOK REVIEWS

DIABETES AND THE EYE, *By F. R. Caird, A. Pirie, T. G. Ramsell, $11.00, 230 pages, Oxford and Edinburgh, Blackwell Scientific Publications, 1969.*

Anyone involved in eye care in the United States today cannot help but be impressed by the increasing number of diabetics who are going blind each year. Since there is an ever-increasing population of diabetics who have had this condition twenty or more years, there will be an increasing number of patients who develop the various eye complications to which diabetics are prone.

The relationship between diabetes and the eye has been investigated by numerous individuals in widely different areas. Their studies have been published in a wide variety of journals. The authors of this excellent little book have done a tremendous service to those of us interested in the problem of diabetes and its relationship to the eye, by compiling this valuable bibliography of pertinent literature. They have, however, done even more by attempting to synthesize the significant and sometime conflicting contributions which have been made. Since there are so many gaps in our knowledge they at times must speculate, but they have been careful to label their own theories as such.

The chapter on "Treatment of Diabetic Retinopathy" does not include some of the latest work on photocoagulation, particularly with lasers; but this whole area is changing so rapidly and expanding so quickly that this cannot be considered a real drawback to the book.

I would recommend this little volume enthusiastically to anyone who is involved in either the care of diabetics or the practice of ophthalmology.

SUSTAINED WEIGHT CONTROL: THE INDIVIDUAL APPROACH, *T. S. Danowski, M.D., 194 pages, Philadelphia, F. A. Davis Co., 1969.*

One cannot help but question the need for yet another "diet book" since so many works of differing background, accuracy and appeal have been published within the last few years. Yet Dr. Danowski's clearly and pleasantly written little volume provides patients and other laymen with all the essentials for an intelligent approach to the problem of weight control. The author's scientific approach and attempt to provide factually based knowledge are evident throughout his work, including references to medical research expressed in easily comprehended terminology. Initially the book deals with food and its requirements, followed by a section explaining calorie needs and the effect of excessive weight upon health in various age groups. Dr. Danowski discusses the concepts of metabolism, hormones, experimental animal models and specific foods before reviewing the individual and his diet. The final section of the book deals with the application of the diet to weight control and emphasizes the need for personal commitment to the program.

Despite the author's recognized eminence in the fields of medicine, metabolism and nutrition, his recent book adds nothing new to an already burgeoning field of popular quasi-medical education. Judged on its accuracy and readibility alone it is commended as a fine reference piece that can be recommended by the busy practitioner for his patients. Despite the ready accessibility of such information we all realize that only a constant and ever renewed effort by the patient and physician, working together, can assure continued successful control of excessive weight.

ABSTRACTS

Alleyne, G. A. O.; Millward, D. J.; and Scullard, G. H. (Med. Res. Council, Tropical Metabolism Res. Unit, Univ. of the West Indies, Kingston, Jamaica): TOTAL BODY POTASSIUM, MUSCLE ELECTROLYTES, AND GLYCOGEN IN MALNOURISHED CHILDREN. J. Pediat. 76:75-81, January 1970.

Verbatim summary. Total body potassium, muscle potassium, magnesium, and glycogen have been estimated in infants while they were malnourished, during recovery, and in several after they were fully recovered. Muscle potassium was curvilinearly related to the total body potassium. Muscle magnesium was reduced, and the potassium/magnesium ratio was depressed in children with low muscle potassium values, implying differential loss of muscle potassium. Muscle potassium was linearly related to muscle glycogen. Twenty-four-hour urinary excretion of creatinine was measured; by assuming that 1 mg. of creatinine was derived from 20 gm. of muscle, calculations of muscle mass were made. In children with a total body potassium over 40 mEq. per kilogram of body weight, muscle potassium contributed approximately one half of the total body potassium; this ratio decreased significantly when body potassium fell to very low values.

Alsever, Robert N.; Georg, Ralph H.; and Sussman, Karl E. (Div. of Endocr., Dept. of Med., Univ. of Colorado Med. Center, Denver, Colo.): STIMULATION OF INSULIN SECRETION BY GUANIDINOACETIC ACID AND OTHER GUANIDINE DERIVATIVES. Endocrinology 86:332-36, February 1970.

Isolated perfused rat pancreas was found to respond to guanidinoacetic acid with higher levels of insulin release than with arginine, creatinine, or guanidine. The insulin response did not appear to be mediated by the parasympathetic supply since atropine was without effect. The guanidino group may

be an intermediate in arginine-stimulated insulin release since pancreas contains high levels of arginine-glycine amidinotransferase. Glycine administration also increases insulin levels in the absence of a guanidino group. It is possible that arginine and glycine may stimulate insulin release through conversion to guanidinoacetic acid. C.R.S.

Bejar, Raphael L.; Smith, George F.; Park, Sungmin; Spellacy, William N.; Wolfson, Sorrell L.; and Nyhan, William L. (Depts. of Pediat. & Obstet. & Gynec., Univ. of Miami Sch. of Med., Miami, Dept. of Pediat., Tampa Gen. Hosp., Tampa, Fla.): CEREBRAL GIGANTISM: CONCENTRATIONS OF AMINO ACIDS IN PLASMA AND MUSCLE. J. Pediat. 76:105-11, January 1970.

Verbatim summary. Two patients have been described with the clinical features of cerebral gigantism. Both had advanced linear growth and skeletal maturation, mental retardation, and characteristic facies. The four-month-old infant was younger than patients previously reported. He had dilated cerebral ventricles. The twenty-six-month-old child had a typical clumsy gait. Growth hormone concentrations were within normal limits and responded normally to insulin and arginine. Both patients had dermatoglyphic abnormalities.

The concentrations of amino acids were studied in the blood, urine and muscle. The concentrations in the plasma of the branched chain essential amino acids, valine, isoleucine, and leucine, were considerably higher than those of control subjects. The ratios of certain essential amino acids to certain nonessential amino acids in the blood were markedly different in patient and control subjects. The glycine: valine ratio appeared to be particularly useful in distinguishing patient from control.

Churchill, Paul C.; and Malvin, Richard L. (Dept. of Physiol., Univ. of Michigan, Ann Arbor, Mich.): RELATION OF RENAL GLUCONEOGENESIS TO AMMONIA PRODUCTION IN THE DOG. Amer. J. Physiol. 218:241-45, January 1970.

Verbatim summary. We tested the hypothesis that renal gluconeogenesis controls NH_3 production in dogs. Net renal glucose production and NH_3 excretion were measured in intact anesthetized control, fasted, and acidotic dogs. Neither fasting nor acidosis stimulated net glucose production; NH_3 excretion however, increased during acidosis and decreased during fasting. Lactate infusions into control dogs increased net glucose production but decreased NH_3 excretion. These observations imply that increased NH_3 excretion is not related to an increase in net glucose production in vivo. Fasting and acidosis stimulated the rate of production of glucose by renal cortex slices without stimulating in vitro NH_3 production from glutamine. There was no relation between glucose and NH_3 productions in vitro. Previous results of others suggested that NH_3 production might be decreased by increased renal concentration of glutamate, but we found that intravenous glutamate had no effect on the NH_3 excretion of acidotic dogs.

Churchill, P. C.; and Malvin, R. L. (Dept. of Physiol., Univ. of Michigan, Ann Arbor, Mich.): RELATION OF RENAL GLUCONEOGENESIS TO AMMONIA PRODUCTION IN THE RAT. Amer. J. Physiol. 218:353-57, February 1970.

It has been widely accepted that acidosis stimulates gluconeogenesis from glutamate and alphaketoglutamate. It has been proposed that the rate of gluconeogenesis in turn, determines the intracellular concentrations of glutamate and alphaketoglutamate, and that these concentrations then determine the rate of NH_3 production from glutamine via the glutaminase pathways. Churchill and Malvin reinvestigated this hypothesis. As a first step in testing this hypothesis, they confirmed that acidosis stimulates and alkalosis depresses the capacities of rat renal cortex slices to synthezise glucose from glutamine. They found with an in vitro system, a high and positive correlation coefficient between changes in NH_3 production rate and the production rate of glucose from glutamine. This correlation did not exist, however, when phenylpyruvate and melonate were used to inhibit glucose production. These latter substances did not prevent an increase of NH_3 production. The authors conclude that the rate of NH_3 production is clearly independent from and not controlled by the renal cortex's ability to produce glucose. They conclude, probably wisely, that the mechanisms which control NH_3 production in the rat are not known. T.J.M.

Fleischmajer, Raul; Faludi, Georgina; and Krol, Stefan (Sect. of Dermatology, Endocr., and Metabolic Diseases, Dept. of Med., Hahnemann Med. Col. and Hosp., Phila., Pa.): SCLEREDEMA AND DIABETES MELLITUS. Arch. Derm. 101: 21-26, January 1970.

Verbatim summary. This is a report of eight cases of scleredema associated with diabetes mellitus. There were six men and two women, with ages ranging from forty-one to eighty years. The predominant clinical features were obesity, long-standing diabetes mellitus, and scleredema; there was a high incidence of heart disease. Five patients had diabetic retinopathy. Six were maturity-onset, overt diabetics while two were chemical or latent diabetics. Most patients were resistant to antidiabetic therapy. On skin biopsies the dermis was about three times thicker than normal. Histologically there was a marked, benign hyperplasia of collagen fibers involving the dermis and subcutaneous tissue. Chemical analysis of the skin revealed an increase in collagen and glycosaminoglycans, proportional to the increase in skin thickness. Analysis of the glycosaminoglycans revealed both hyaluronic acid and dermatan sulfate.

Goldfine, I. D.; Abraira, C.; Gruenewald, D.; and Goldstein, M. S. (Div. of Metab., and Endocr., Dept. of Med. and Psychiatry, Michael Reese Hosp. and Med. Center, Chicago, Ill.): PLASMA INSULIN LEVELS DURING IMAGINARY FOOD INGESTION UNDER HYPNOSIS. Proc. Soc. Exp. Biol. Med. 133: 274-76, January 1970.

Verbatim summary. Seven healthy subjects were exposed to imaginary food ingestion under hypnotic stimulus and plasma glucose, immunoreactive insulin and NEFA were measured during the experiment. Three subjects showed elevation in plasma insulin either after the induction of "hunger" or after the beginning of the "meal." Fall in NEFA was seen in four subjects. No changes in blood glucose were detected.

Hansen, Robert J.; Pilkis, Simon J.; and Krahl, M. E. (Depts. of Physiol., Univ. of Chicago, Chicago, Ill.; Stanford Univ., Stanford, Calif.): EFFECT OF INSULIN ON THE SYNTHESIS IN VITRO OF HEXOKINASE IN RAT EPIDIDYMAL ADIPOSE TISSUE. Endocrinology 86:57-65, January 1970.

Insulin was shown to increase the hexokinase content of epididymal fat pads, in vitro, using glucose, pyruvate or alanine as energy source. Glucose and pyruvate alone but not insulin alone produced some increase in hexokinase content.

A double labeling technic was employed to demonstrate that insulin stimulates incorporation of histidine into hexokinase protein. Insulin did not reduce the rate of release of histidine from the enzyme. The results are consistent with that view that insulin stimulation of hexokinase activity in adipose tissue is accompanied by de novo synthesis of hexokinase protein. C.R.S.

Joffe, B. I.; Krut, L.; Bank, S.; Marks, I. N.; and Keller, P. (Endocr. Res., Lipid Res. & Gastrointestinal Units, Dept. of Med., and Groote Schuur Hosp., Univ. of Cape Town, Cape Town, So. Africa): SERUM LIPID LEVELS IN DIABETES SECONDARY TO CHRONIC PANCREATITIS. Metabolism *19*:87-90, January 1970.

The mean fasting levels of serum cholesterol and phospholipids in twenty patients with diabetes due to pancreatitis were lower than those found in patients with essential diabetes and normal controls. Fasting triglycerides were not significantly different in the three groups although lowest in the pancreatitis groups. A reduced intake or deficient absorption of dietary fat appear unlikely to have been responsible for the relative hypolipidemia in pancreatic diabetes. The reduced incidence of diabetic microangiopathy in pancreatic diabetes may be related to the reduced levels of serum lipids in this group. The value of the serum cholesterol level as a diagnostic aid in differentiating between essential and pancreatic diabetes is suggested. C.R.S.

Kattermann, R.; and Kobberling, J. (Div. of Gastroenterology and Metabolic Disorders and the Sect. of Clin. Chem., Dept. of Med., Univ. of Gottingen, Gottingen, Germany): SERUM LIPIDS IN FIRST-DEGREE RELATIVES OF DIABETICS[1]. CORRELATION WITH BODY-WEIGHT AND GLUCOSE TOLERANCE. Germ. Med. Mth. *15*:47-52, January 1970.

Verbatim summary. The concentrations of blood glucose, free fatty acids, free glycerol, triglycerides and cholesterol were measured before and one hour after oral intake of 75 gm. of glucose in sixty-nine first-degree relatives of maturity-onset diabetics. The subjects were divided into four groups on the basis of their body-weight and glucose tolerance. Group 1: persons of normal weight with a normal glucose tolerance and normal lipid levels. Group 2: more than 30 per cent overweight, normal glucose tolerance, but a rise in all lipid values (statistically significant rise in free glycerol and triglycerides in comparison with Group 1). Group 3: normal weight, but abnormal glucose tolerance and a lesser rise in triglyceride levels (statistically not significant), with raised free fatty acid and free glycerol levels (statistically significant). Group 4: overweight by more than 30 per cent and abnormal glucose tolerance, with a highly significant rise in free fatty acids and triglycerides, but not of cholesterol. It is concluded that where a predisposition to diabetes is inherited, the degree of risk of diabetes can be assessed by appropriate tests. Therapeutic measures can then effect a lowering of serum lipid levels and thus possibly delay the late complications of arteriosclerosis.

Maragoudakis, Michael E. (CIBA Pharmaceutical Co., Res. Dept., Summit, New Jersey): ON THE MODE OF ACTION OF LIPID-LOWERING AGENTS II. IN VITRO INHIBITION OF ACETYL COENZYME A CARBOXYLASE BY A HYPOLIPIDEMIC DRUG. Biochemistry 9:413-17, Jan. 20, 1970.

Verbatim summary. Hypolipidemic agents of the nature of CPIB may owe their in vivo effect to ability to depress acetyl-CoA carboxylase activity. Thereby, they could control rate and extent of fatty acid and cholesterol synthesis. The most recently described member of this class of agents—CDIB—is active in vivo at much lower doses than is CPIB. It was to be expected that CDIB would also be a more potent inhibitor of the enzyme, acetyl-CoA carboxylase, and this prediction was fully borne out by the study reported.

It seems likely that all three hypolipidemic drugs studied (TPIA, CDIB, and CPIB) have the same mechanism of interaction with the enzyme since they are all competitive for isocitrate and acetyl-CoA and noncompetitive for ATP and HCO_3—.

Competitive inhibition for isocitrate and acetyl-CoA may indicate that the drugs interfere with the activity of acetyl-CoA carboxylase, either by competing with the substrate for the same active site on the enzyme protein, or by interfering with the activation process of the enzyme by competing with the activator, isocitrate.

Nestel, Paul J.; Carroll, Kevin F.; and Havenstein, Nathalie (Dept. of Clin. Science, John Curtin Sch. of Med. Res., The Australian National Univ., Canberra, Australia): PLASMA TRIGLYCERIDE RESPONSE TO CARBOHYDRATES, FATS AND CALORIC INTAKE. Metabolism *19*:1-18, January 1970.

Among the factors influencing plasma triglyceride concentration are the caloric intake, the amount and type of carbohydrate and the fat content of the diet. Changes in rates of triglyceride entry, removal or both are affected by the level of FFA turnover, insulin secretion or body weight. Using infused radiopalmitate the total appearance of radioactive FFA in triglyceride fatty acids (TGFA) was always greater with sucrose than with starch feedings; the higher triglyceride levels showed that removal of TGFA was less efficient. Glucose and fructose raised triglyceride to a similar extent but the rate of formation of TGFA was greater with glucose. Saturated fats resulted in higher triglyceride levels although the rate of incorporation of FFA into TGFA was less than with polyunsaturated fats suggesting that saturated fats reduced the removal rates for triglycerides. Carbohydrate-rich diets demonstrated a rise in triglyceride levels associated first with an increase and later with a decrease in the incorporation of FFA into TGFA. During starvation the triglyceride concentration fell with a concomitant increase in the rate of appearance of FFA in TGFA. Plasma FFA turnover increased but insulin responsiveness to glucose fell. Overeating, similar to sucrose feeding, led to a rise in triglyceride levels and the insulin response; inadequate removal of TGFA was a major cause of hypertriglyceridemia. Among subjects receiving eucaloric carbohydrate rich diets the plasma triglycerides were related to the FFA turnover, the appearance of FFA in TGFA, to the insulin response and to the ponderal index, the latter two factors demonstrating a significant correlation. C.R.S.

Olsen, W. A.; and Rosenberg, I. H. (Thorndike Memorial Lab. and the Second and Fourth [Harvard] Med. Serv., Boston City Hosp., the Gastroenterology Res. Lab., Madison Veterans Administration Hosp., and the Depts. of Med., Harvard Med. Sch., Boston, Mass. and the Univ. of Wisconsin, Madison, Wis.): INTESTINAL TRANSPORT OF SUGARS AND AMINO ACIDS IN DIABETIC RATS. J. Clin. Invest. *49*:96-105, January 1970.

Verbatim summary. The specificity and mechanism of altered intestinal transport of diabetic rats was studied with an everted ring technic. Increased intracellular accumulation of amino acids, as well as galactose and 3-o-methylglucose, was demonstrated in diabetes. The greater accumulation by diabetic intestine could not be attributed to a direct effect of the agent used to induce diabetes or to an alteration in food consumption. Although the changes were related to the severity of diabetes and could be reversed with treatment with insulin, they could not be modified by addition of insulin in vitro. The changes could not be induced in control intestine either with hyperglycemia from glucose infusion or preincubation with glucose in vitro.

Although the higher concentration gradients of amino acids, galactose, and 3-o-methylglucose could result from increased energy utilization by diabetic intestine, an alteration of cell membrane function, as well, is suggested by the demonstration with kinetic studies of increased influx with an increase in Vmax.

Ondetti, Miguel A.; Pluscec, Josip; Sabo, Emily F.; Sheehan, John T.; and Williams, Nina (Squibb Inst. for Med. Res., New Brunswick, New Jersey): SYNTHESIS OF CHOLECYSTOKININ-PANCREOZYMIN. I. THE C-TERMINAL DODECAPEPTIDE. J. Amer. Chem. Soc. 92:195-99, Jan. 14, 1970.

The synthesis of the C-terminal decapeptide fraction of cholecystokinin-pancreozymin from three small peptide fragments is described. The C-terminal decapeptide was identical to its natural counterpart, as determined by partial tryptic digestion, and it possessed biological activity similar to the parent hormone. P.B.

Rudman, D.; Del Rio, A. E.; Garcia, L. A.; Barnett, J.; Howard, C. H.; Walker, W.; and Moore, G. (Depts. of Med. and Biochem., Emory Univ. Sch. of Med., and the Yerkes Primate Res. Center, Atlanta, Georgia): ISOLATION OF TWO LIPOLYTIC PITUITARY PEPTIDES. Biochemistry 9:99-108, Jan. 6, 1970.

During the past ten years, three laboratories have reported on novel pituitary peptides which are highly active lipolytic agents on rabbit adipose tissue, but virtually inactive on the rat tissue. (1) This laboratory described a fraction of pig pituitary, labeled fraction H (Rudman et al., 1960), and, in more purified form, fraction L (Rudman et al., 1961), which was lipolytic in vitro and in vivo in the rabbit but not in the rat. These preparations were weakly active on guinea pig adipose tissue, but inactive on the tissues of mouse, hamster, dog, and pig (Rudman et al., 1962). (2) Astwood and collaborators (Astwood et al., 1961) isolated from pig pituitaries two peptides labeled I and II, both of which were active on the rabbit but not on the rat tissue. Peptide II was found by electrophoretic and immunologic tests to be identical with the major component in fraction H (Friesen et al., 1962). (3) Li and colleagues have isolated three novel lipolytic peptides from sheep, pig, and human pituitaries, labeled fraction L' (Birk and Li, 1964), β-lipotropin (Li et al., 1965; Graf and Cseh, 1968; Cseh et al., 1968), and γ-lipotropin (Chretien and Li, 1967), all highly active on rabbit adipose tissue but only weakly so on the rat tissue.

A side product in isolation of ACTH and the MSH's from pig pituitaries at Armour possesses considerable lipolytic activity in the rabbit. This side product is labeled "fraction 7." The report describes: (1) isolation from fraction 7 of two peptides with lipolytic activity in the rabbit; (2) characterization of the two peptides by disc electrophoresis, amino acid composition, molecular weight, and assay for lipolytic activity in seven other species besides the rabbit. On the basis of these characteristics, the authors discuss the probable relationship of these two peptides to the previously identified lipolytic pituitary peptides. One of these, peptide 7D6, is very similar to porcine fraction L and Astwood's porcine peptide II. D.R.C.

Spitz, I. M.; Rubenstein, A. H.; Bersohn, I.; and Bassler, K. H. (Dept. of Med. & Renal Unit, Witwatersrand Med. Sch., and the South African Inst. for Med. Res., Johannesburg, S.A.; Dept. of Med., Univ. of Chicago, Chicago, Ill.; Dept. of Physiol. Chem., Johannes Gutenberg Univ., Mainz, West Germany): METABOLISM OF XYLITOL IN HEALTHY SUBJECTS AND PATIENTS WITH RENAL DISEASE. Metabolism 19:24-34, January 1970.

Xylitol infusions administered to uremic patients and control subjects demonstrated that this polyhydric alcohol is utilized well in renal failure. Xylitol stimulated this release of insulin, induced a fall in plasma phosphate and suppressed FFA after slow infusion. Glucose intolerance was manifested in uremic subjects while xylitol was well utilized. Xylitol should prove a useful source of calories in uremia and in other conditions characterized by insulin resistance and carbohydrate intolerance. C.R.S.

Steelman, S. L.; Morgan, E. R.; Cuccaro, A. J.; and Glitzer, M. S. (Dept. of Endocr., Merck Inst. for Therapeutic Res., Rahway, N.J.): GROWTH HORMONE-LIKE ACTIVITY IN HYPOPHYSECTOMIZED RATS IMPLANTED WITH SPIROMETRA MANSONOIDES SPARGANA. Proc. Soc. Exp. Biol. Med. *133*: 269-73, January 1970.

Verbatim summary. The subcutaneous implantation of *Spirometra mansonoides* spargana into hypophysectomized rats produced a striking increase in body weight and tibial cartilage width comparable to that noted with growth hormone. Other tissue responses confirmed this similarity. Injection of plasma from implanted rats also produced a growth hormone-like response including a stimulation of the uptake of $35\text{-}SO\text{-}4^{2-}$ by costal cartilage.

Thorell, J. I. (Dept. of Path., Univ. of Uppsala, and Dept. of Clin. Chem., Univ. of Lund at Malmo Gen. Hosp., Malmo, Sweden): PLASMA INSULIN LEVELS IN NORMAL HUMAN FOETUSES. Acta Endocr. 63:134-40, January 1970.

Verbatim summary. Immunoreactive insulin was measured in plasma collected from human foetuses as gestational ages of fifteen to twenty-six weeks, as well as from their mothers. In the fasting stage, the mean insulin concentration in the foetal heart was 29 μU/ml. (range 6-74 μU/ml.) and in the umbilical vessels 19 μU/ml. (range 10-36 μU/ml.). The corresponding maternal value was 11 μU/ml. (range 6-30 μU/ml.). After giving the mothers a glucose load, the maternal insulin level increased considerably, but no change was found in the foetal plasma. There was no correlation between foetal weight and foetal plasma level.

Tzagournis, Manuel; and Skillman, Thomas G. (Div. of Endocr. & Metab., Dept. of Med., Ohio State Univ. Hosps., Columbus, Ohio): GLUCOSE INTOLERANCE MECHANISM AFTER STARVATION. Metabolism 19:170-78, February 1970.

Obese subjects were studied during control, fasting and refeeding periods. During the refeeding period after a four-

teen-day fast, a decrease in glucose tolerance was consistently observed. In examining the basis of this abnormality it was shown that exogenous insulin sensitivity did not differ during the three study periods. Human growth hormone responses to hypoglycemia were excellent during control and fasting periods but were slightly depressed during refeeding. Complete alpha and beta blockade did not affect insulin sensitivity or the HGH response to hypoglycemia. FFA levels did not effect insulin sensitivity to exogenous insulin. Cortisol concentrations were unchanged during the study. Carbohydrate intolerance during refeeding was associated with a lower than normal insulin/glucose ratio at the one-hour interval of the oral GTT. With rising blood glucose, insulin levels subsequently rose higher than those in the control period. Apparently a major factor in starvation diabetes is a deficiency in the secretion or synthesis of insulin during the early portion of the glucose tolerance test. C.R.S.

Vander Ark, Condon R.; and Reynolds, Ernest W. (Heart Station, Dept. of Intern. Med., Univ. of Michigan Med. Center, Ann Arbor, Mich.): CLINICAL EVALUATION OF GLUCAGON BY CONTINUOUS INFUSION IN THE TREATMENT OF LOW CARDIAC OUTPUT STATES. Amer. Heart. J. 79:481-87, April 1970.

Verbatim summary. A continuous infusion of glucagon in an average dose of 4 mg. per hour over several days produced distinct improvement in the clinical state of twelve of sixteen patients. Improvement was noted by an increase in blood pressure and urinary output and decrease in dyspnea, pulmonary rales, diaphoresis, and peripheral edema when present. Serum potassium must be carefully monitored. The rise in blood glucose has not been a clinical problem. No cardiac arrhythmias were induced by glucagon, and as cardiac function improved, the heart rate usually decreased. Nausea was the most frequent side effect, but no toxic effects or tachyphylaxis were observed. Long-term therapy with glucagon infusion is both safe and highly efficacious in selected patients with severe cardiovascular disease states and is the treatment of choice in cardiac decompensation secondary to beta-blocking agents.

Vela, A. Richard; and Balart, Louis A. (Depts. of Surg. and Med., Louisiana State Univ., Sch. of Med., New Orleans, Louisiana): ESOPHAGEAL MOTOR MANIFESTATIONS IN DIABETES MELLITUS. Amer. J. Surg. *119*:21-26, January 1970.

Verbatim summary. Manometric examination of the esophagus in twenty-five diabetic patients (twenty women and five men) twenty to sixty-nine years of age disclosed significant alterations in esophageal motor function in twenty-four.

The prominent sites of functional disturbances involved the gastroesophageal sphincter and the thoracic and cervical segments of the esophagus. The characteristic motor manifestations included decreased tonicity and impaired relaxation of the gastroesophageal sphincter on swallowing, simultaneous segmental contractions in the thoracic esophagus, and weakened or absent primary peristalsis in the cervical esophagus. No correlation existed between the high incidence of esophageal dysfunction and patients' symptoms, age, or onset or duration of diabetes.

It is believed that the alteration in esophageal motility is the result of vagal neuropathy in the esophagus secondary to diabetes, affecting perhaps the striated and subsequently the smooth muscular section of the organ.

Although no claim is intended that the pressure complex is diagnostic of diabetes, it is found useful in detecting diabetes during routine manometric examinations of the esophagus.

Werrbach, Jon H.; Gale, Charles C.; Goodner, Charles J.; and Conway, Martin J. (Robt. H. Williams Lab. for Clin. Investigation, Depts. of Med., Harborview Med. Center & Univ. of Washington Sch. of Med., & Regional Primate Res. Center, & Dept. of Physiol. & Biophysics, Univ. of Washington, Seattle, Wash.): EFFECTS OF AUTONOMIC BLOCKING AGENTS ON GROWTH HORMONE, INSULIN, FREE FATTY ACIDS AND GLUCOSE IN BABOONS. Endocrinology *86*:77-82, January 1970.

Trained conscious baboons were used to examine the effects of autonomic blockade on serum GH, IRI, FFA, and plasma glucose. Alpha adrenergic blockade using phentolamine depressed GH secretion and increased IRI secretion while glucose decreased. Beta adrenergic blockade was associated with a rise in GH and decreases in IRI, FFA and glucose. When beta or ganglionic blockade was superimposed on alpha adrenergic blockade the GH elevating effect of beta blockade was prevented, suggesting a direct effect on GH secretion independent of hemodynamic or hypoglycemic changes. The data show that blockade of adrenergic mechanisms causes synchronous reciprocal changes in GH and IRI and suggest that alpha adrenergic activity stimulates and beta adrenergic activity inhibits the release of GH. C.R.S.

Woods, S. C.; Hutton, R. A.; and Makous, F. (Depts. of Physiol., Biophysics, and Psychology, Univ. of Washington, Seattle, Wash.): CONDITIONED INSULIN SECRETION IN THE ALBINO RAT. Proc. Soc. Exp. Biol. Med. *133*:964-68, March 1970.

Verbatim summary. Although the phenomenon of conditioned hypoglycemia is now well established, little is known about its mechanism. The present experiments lead to the conclusion that the mechanism involves a release of insulin: Experiment 1 showed that rats given an injection of streptozotocin, a drug which destroys the beta cells of the islets of Langerhans, did not show a conditioned hypoglycemia, whereas rats given only the vehicle for the streptozotocin did; and in experiment 2, blood drawn from conditioned rats just before the conditioned hypoglycemia would normally occur showed greater insulin-like activity than blood drawn from control rats. These results demonstrate a conditioned release of some hypoglycemic agent that depends upon the integrity of the beta cells. A neural control over release of insulin must be inferred to explain them.