ABSTRACTS

Aylett, Pamela (The Gordon Hosp., Vauxhall Bridge Rd., London, S.W. 1, England): THE EFFECTS OF GLUCAGON AND GLUCAGON-FREE INSULIN UPON GASTRIC SECRETION IN PEPTIC ULCER PATIENTS. Clin. Sci. 22:179-84, April 1962.

Glucagon-reduced and glucagon-free insulin increased the concentration of acid and chlorides in mixed gastric contents. Glucagon appeared as effective in reducing gastric secretion in the presence of insulin as when given alone. The gastric secretory response did not consistently relate to the changes induced in blood glucose concentration. G.D.M.

Bagdon, Robert E.; and Hall, F. (Dept. of Pharmacol., Hoffmann-La Roche, Inc., Nutley, N.J.): STUDIES ON A METHOD FOR ASSAYING THE METABOLIC EFFECTS OF INSULIN ON ADIPOSE TISSUE IN VITRO AND IN VIVO. J. Pharmacol. & Exp. Ther. 136:205-08, May 1962.

Production of carbon dioxide by the rat epididymal fat pad in Krebs-Ringer bicarbonate buffer solution was measured in a Warburg vessel to determine baseline activity. Addition of 0.00025 (minimum) to 0.1 (maximum) units per ml. of aqueous insulin solution produced a range of CO_2 release (10 to 21 μl. per 100 mg. per hour). In intact rats, hypoglycemia occurred thirty to sixty minutes after subcutaneous insulin injection and correlated well with metabolic activity. Oxidation of the carbon-1 of glucose provided the carbon dioxide, possibly by way of the phosphogluconate oxidative pathway. The assay system was adequate to measure small amounts of insulin either in vitro or in vivo, and is quite specific. Ordinary concentrations of adrenocorticotropin, bovine serum albumin, growth hormone or prolactin failed to interfere with carbon dioxide production (Winegrad). A.R.C., JR.

Bannerman, R. M.; Callender, Sheila T.; and Williams, D. L. (The Nuffield Dept. of Clinical Medicine, the Radcliffe Infirmary, Oxford, England): EFFECT OF DESFERRIOXAMINE AND D.T.P.A. IN IRON OVERLOAD. Brit. M. J. 2:1573-77, Dec. 15, 1962.

Increase in urinary iron excretion was measured in three men with normal iron stores, in three patients with iron overload (transfusion siderosis), and in three male hemochromatotics following administration of the chelating agent Desferrioxamine B (product of Ciba's strain of Streptomyces pilosus). Oral desferrioxamine 600 mg./day produced no significant increase in urinary iron, but intravenous or intramuscular injections totaling 600 mg./day raised urinary iron excretion considerably. Excretions increased by 1 to 1.5 mg./day in the subjects without iron overload, 8 to 33 mg./gm. of chelate in those with iron overload, and 30 to 36 mg. iron per gram of chelate in those with previously untreated (by venesection) hemochromatosis. In one man who had been partially treated by venesection (thirty-one pints) only 1 mg. of iron per gram of chelate above the baseline excretion was removed.

One patient with transfusion siderosis received intravenous and then intramuscular DPTA (Diethylentriamine-penta-acetate). Urinary iron excretion was increased by 17 mg. per gram of chelate, but great pain was produced by the intramuscular injections.

The authors emphasize the following: Desferrioxamine promises to be the most useful chelating agent for iron yet available. Injections are well tolerated. Its specificity makes it unlikely that depletion of other body substances will occur. Excretion of iron is maximal at the beginning of treatment and is lessened by prior venesections, which suggests that only the readily mobilizable iron is excreted, and that intermittent rather than continuous therapy is desirable. In patients with hemochromatosis, the much greater amount of iron removed by venesection indicates the latter to be the treatment of choice. In those patients with refractory anemia, especially thalassemia major or, in situations of acute iron overloading, desferrioxamine may well be a particularly useful aid in treatment. The oral administration of desferrioxamine has produced variable effects upon iron absorption in the bowel and warrants further study. R.F.B.

Beckett, A. Gordon; and Matthews, D. M. (Dept. of Diabetes, Royal Free Hosp., London, England): VITAMIN B_{12} IN DIABETES MELLITUS. Clin. Sci. 23:361-70, October 1962.

Serum concentration of vitamin B_{12} was estimated microbiologically while rate of urinary excretion of injected radioactive vitamin B_{12} was also measured in 150 diabetic and seventy-five control patients. In both categories, elevation of serum vitamin B_{12} levels occurred only in subjects with renal disease, apparently due to failure of urinary excretion. The authors found that high serum vitamin B_{12} concentration may sometimes precede other manifestations of renal disease. A larger proportion of the injected vitamin B_{12} was excreted by patients with diabetic retinopathy than by the other subjects. Renal disease with or without diabetes and independent of the presence of retinopathy slowed renal excretion of the vitamin. No evidence was found of vitamin B_{12} deficiency in diabetes nor that such deficiency has a part in the etiology of diabetic retinopathy. G.D.M.

Berns, Aline W.; Hirata, Y.; and Blumenthal, Herman T. (Inst. of Experimental Pathology, The Jewish Hosp., St. Louis, Mo.): APPLICATION OF FLUORESCENCE MICROSCOPY TO THE STUDY OF POSSIBLE INSULIN-BINDING REACTIONS IN FORMALIN-FIXED MATERIAL. J. Lab. Clin. Med. 60:535-51, October 1962.

Because of the similarity of the vascular proliferative lesions of diabetes to lesions produced by immunogenic mechanisms, the authors have developed methods for the study of formalin-fixed paraffin-imbedded tissues using fluorescein-labeled insulin. The latter was found to behave essentially as I-131-labeled insulin regarding binding to guinea pig anti-beef insulin antibody. Its reaction with formalin-fixed diabetic glomerular lesions was comparable to that observed with fresh frozen tissue of the same origin, but the fluorescein-tagged insulin did not bind to glomeruli representing nondiabetic lesions. Fluorescein-labeled antibody was also found to bind to the granules of beta cells of the islands of Langerhans. Formalin, alcohol and xylol did not interfere with such bindings. T.G.S.

Best, Charles H. (Banting and Best Dept. of Med. Res. and Dept. of Physiol., Univ. of Toronto, Toronto, Ont.): SOME THOUGHTS ON THE ETIOLOGY OF HUMAN DIABETES. Canad. Med. Assn. J. *87*:731-34, Oct. 6, 1962.

The following is a suggested classification of the possible causes of diabetes mellitus based on the assumption that the disorder is genetically controlled:

1. Defects in the pancreas as a whole, including the beta cells.
2. Defects in the formation of insulin.
3. Defects in the liberation of insulin.
4. Abnormal destruction of insulin.
5. Genetic defects involving insulin-dependent reactions.
6. Excess of diabetogenic substances.
7. Genetic defects making tissues abnormally susceptible to diabetogenic substances.
8. Genetic defects independent of hormonal actions.

The mechanisms by which each of these causes might produce the abnormalities in metabolism are discussed from a physiological viewpoint. B.F.K.

Bittar, Edward E.; and Misanik, Lawrence (Dept. of Pathology, District of Columbia General Hosp., Washington, D.C.): RENAL NECROTIZING PAPILLITIS. Amer. J. Med. *34*:82-87, January 1963.

Clinical and pathological findings in eighteen patients with renal necrotizing papillitis are reviewed. Half of these occurred in patients with diabetes mellitus. Only twelve of the eighteen showed bacterial growth on urine culture, but chronic pyelonephritis was present in almost all microscopically. Diabetic glomerulosclerosis was found in one of the nine diabetics, and venous thrombosis in three of the fifteen patients. Clinical diagnosis was very difficult in this group. S.B.B.

Bodel, P. T.; Rubinstein, D.; McGarry, E. E.; and Beck, J. C. (McGill Univ. Clin., Royal Victoria Hosp. & Dept. of Biochemistry, McGill Univ., Montreal, Que.): UTILIZATION OF FREE FATTY ACIDS BY DIAPHRAGM IN VITRO. Amer. J. Physiol. *203*:311-15, August 1962.

Human and rat diaphragm and rat gastrocnemius muscle oxidize and esterify palmitate-I-C14. Incorporation of C-14 was in proportion to the palmitate present in the medium over a range of concentrations from 0.8 to 2.9 μEq./ml. Fasting increased $C\text{-}14O_2$ production but had no effect on esterification. Iodoacetate or an atmosphere of nitrogen inhibited esterification of palmitate but increased the amount of free fatty acid in the tissue. Insulin increased esterification, and this was enhanced by the addition of glucose. Glucose and insulin exerted a sparing action on the oxidation of glycerides by a tissue previously charged with palmitate-I-C-14. Growth hormone administered in vivo over a period of one week or in vitro during incubation had no effect on esterification or metabolism of palmitate-I-C-14. M.G.B.

Borison, H. L.; Fishburn, B. R.; Bhide, N. K.; and McCarthy, L. E. (Dept. of Pharmacology, Univ. of Utah Coll. of Medicine, Salt Lake City, Utah): MORPHINE-INDUCED HYPERGLYCEMIA IN THE CAT. J. Pharmocol. Exp. Ther. *138*:229-35, November 1962.

Intravenous injection of morphine sulfate in 0.9 per cent sodium chloride in a dose of 10 mg. per kilogram of body weight caused a consistent elevation in blood glucose amounting to 200 per cent within thirty minutes in cats. Injection of 900 μg. (or 1/25 to 1/50 of the intravenous dose) into the lateral ventricle produced comparable hyperglycemia. A small volume of the agent introduced into the interventricular foramen of Monro gave a greater response than a large volume diffusing throughout the ventricular system. Intraventricular injection of nalorphine (1 to 2 mg.) inhibited the hyperglycemic response to morphine, but the response was not affected by destruction of the area postrema of the medulla oblongata. The hyperglycemic action of morphine is elicited via a paraventricular receptor site, whereas its emetic action is effected through the area postrema. Injection of epinephrine intrathecally was much more potent in inducing hyperglycemia than intraventricular or even intravenous injection. This tends to speak against a central mechanism for epinephrine hyperglycemia. A.R.C., JR.

Brande, P. F.; and Knobil, E. (Dept. of Physiol., Harvard Med. Sch., Boston, Mass.): FURTHER EVIDENCE FOR AMINO ACID TRANSPORT AS A SITE OF ACTION OF GROWTH HORMONE. Proc. Soc. Exper. Biol. Med. *110*:5-6, May 1962.

Addition of growth hormone to intact, isolated diaphragms of hypophysectomized rats accelerates the transport of AIB-1-C-14 (alpha-amino-isobutyric acid) into the intracellular compartment of muscle cells. This is competitively inhibited by leucine and glycine but not by phenylalanine or glutamic acid. These findings support further the hypothesis that amino acid transport may be a site of action of growth hormone in the regulation of protein metabolism. M.G.B.

Buckle, R. M. (Dept. of Medicine, St. Bartholomew's Hosp., London, E.C. 1, England): THE STIMULATING EFFECTS OF ADRENALINE AND ANTERIOR PITUITARY HORMONES ON THE RELEASE OF FREE FATTY ACIDS FROM ADIPOSE TISSUE. J. Endocr. *25*:189-98, October 1962.

Segments of rat epididymal fat pads were incubated in Krebs-Ringer bicarbonate buffer containing 5 per cent serum albumin. Various hormones were added to the incubation medium, and the increase in free fatty acids within the tissue and in the medium was measured. Adrenaline, adrenocorticotrophic hormone, thyroid stimulating hormone, and growth hormone increased the amount of free fatty acids found in tissue and medium at the end of incubation, and the respective minimum effective concentrations of the hormones were 0.125, 0.004, 0.5 and 1.25 μg. per ml. of medium. H.T.N.

Burt, Richard L.; Leake, Norman H.; and Dannenburg, Warren N. (Dept. Obstetrics & Gynecology, Bowman Gray Sch. of Medicine, Wake Forest Coll. & North Carolina Baptist Hosp., Winston-Salem, N.C.): PLASMA NONESTERIFIED FATTY ACIDS IN PREGNANCY. III. FURTHER OBSERVATIONS ON REGULATION OF PLASMA NEFA CONCENTRATION BY INSULIN AND GLUCOSE. Amer. J. Obstet. Gynec. *84*:1081-90, Oct. 15, 1962.

Several experimental studies to determine regulation of plasma NEFA concentration by glucose and insulin were done on pregnant human subjects between thirty-nine and forty weeks' gestation, on patients after fourth or fifth postpartum days of normal pregnancy and on normal nonpregnant subjects as controls. The authors concluded: (1) NEFA fall is increased with small amounts of glucose while large amounts of glucose tend to produce smaller changes. (2) The change in NEFA concentration is influenced by the relative amount of carbohydrate and insulin rather than the degree of hyperglycemia and hypophosphatemia. (3) The concentration of plasma NEFA is increased and its regulation is extremely labile within a few days after onset of labor. (4) The NEFA

concentration in the plasma does not exhibit the lability in early puerperium and it may be postulated that this is a humoral response to the stress of labor and delivery. E.A.W.

R.-Candela, R.; R.-Candela, J. L.; Martin-Hernandez, D.; and Castilla-Cortazar, T. (Instituto G. Marañon C.S.I.C., Madrid, Spain): EFFECT OF INSULIN ON GLUCOSE UPTAKE BY THE UTERUS OF THE RAT, IN VITRO, DURING CONTRACTION AND RELAXATION. Proc. Soc. Exper. Biol. Med. *109*:795-96, April 1962.

Rat uteri were studied in vitro during periods of relaxation (hypocalcic medium), spontaneous contraction (balanced salt solution), Tensilon-enhanced spontaneous contractions, and acetyl-choline-induced tetanic contractions. The addition of Tensilon to the medium increased glucose utilization of uteri. Insulin (0.1 U./ml.) increased glucose utilization of uteri during acetyl-choline-induced tetanic contractions. M.G.B.

R.-Candela, R.; and R.-Candela, J. L. (Instituto G. Marañon, Madrid, Spain): POSSIBLE FACTOR PRODUCED DURING MUSCULAR CONTRACTION WHICH INFLUENCES THE PASSAGE OF GLUCOSE. Proc. Soc. Exper. Biol. Med. *110*:803-04, August-September 1962.

Rat diaphragms, adipose tissue, kidney and brain slices were incubated. The buffer contained aliquots of media in which either "contracting" rat uteri or "relaxed" rat uteri had been incubated. The tissues utilized more glucose in the presence of media in which contracting uteri had been incubated. M.G.B.

Carter, William J.; and Younathan, Ezzat S. (Dept. of Biochemistry, Univ. of Arkansas Med. Center, Little Rock, Ark.): STUDIES ON PROTECTION AGAINST THE DIABETOGENIC EFFECT OF ALLOXAN BY GLUCOSE. Proc. Soc. Exper. Biol. Med. *109*:611-12, March 1962.

Glucose and its nonmetabolizable analogue 3-methyl-D-glucose protects the rat against the diabetogenic effect of alloxan, when injected intravenously (0.006 mole/kg.) five minutes prior to the injection of alloxan. Alpha-D-methyl-glucoside, DL-lactate and several Krebs cycle intermediates fail to prevent alloxan diabetes. The findings suggest that the hexokinase reaction is not involved in the protective action of glucose against alloxan diabetes. M.G.B.

Chan, Stephen S.; and Lotspeich, William D. (Dept. of Physiol., Univ. of Rochester, Sch. of Medicine & Dentistry, Rochester, N.Y.): COMPARATIVE EFFECTS OF PHLORIZIN AND PHLORETIN ON GLUCOSE TRANSPORT IN THE CAT KIDNEY. Amer. J. Physiol. *203*:975-79, December 1962.

Small amounts of phlorizin or phloretin were infused into one renal artery and the net tubular absorption of glucose (T_G) measured in both kidneys. At concentrations in the range of 10^{-5} to 10^{-7} M in renal blood phlorizin inhibited glucose transport across the renal tubule. Phloretin was at least ten times less effective in inhibiting T_G than phlorizin. When blood glucose was elevated, small amounts of phlorizin or phloretin caused greater inhibition of T_G than at physiological blood sugar levels. M.G.B.

Chernick, Sidney S.; Scow, Robert O.; Simon, Ernst; and Stricker, Frances A. (Lab. of Nutrition & Endocrinology & of Biochemistry & Metabolism, National Inst. of Arthritis & Metabolic Diseases, National Inst. Health, Bethesda, Md.): EFFECTS OF MANNOHEPTULOSE ON GLUCOSE METABOLISM OF ISOLATED TISSUES. Proc. Soc. Exper. Biol. Med. *109*:589-92, March 1962.

The mechanism of the diabetogenic action of mannoheptulose has been investigated by testing its action on glucose metabolism by isolated tissues. Mannoheptulose did not alter the in vitro metabolism of glucose by liver, kidney, diaphragm, or epididymal fat pad. The stimulating effects of insulin on glucose metabolism of diaphragm and adipose tissue were not decreased by mannoheptulose. M.G.B.

Coulson, Roland A.; and Hernandez, Thomas (Depts. of Biochemistry and Pharmacol., Louisiana State Univ. Sch. of Medicine, New Orleans, La.): HYPERGLYCEMIC EFFECT OF GLUCOSAMINE. Amer J. Physiol. *203*:243-47, August 1962.

The injection of large amounts of glucosamine into alligators or rats caused marked hyperglycemia. Galactosamine or N-acetylglucosamine did not affect the blood sugar. Smaller doses of glucosamine did not cause hyperglycemia when given alone, but significantly decreased glucose tolerance. Glucosamine did not affect plasma lactic acid or liver glycogen. Glucosamine and galactosamine were excreted in the urine as rapidly as thiosulfate. Insulin treatment prevented glucosamine-induced hyperglycemia and accelerated the disappearance of the amino-sugar from the plasma. The authors suggest that glucosamine inhibits peripheral glucose utilization and could be considered to be diabetogenic. M.G.B.

Danowski, T. S.; Bonessi, James V.; and Moses, Campbell (Sect. of Endocrinology & Metabolism, Addison H. Gibson Lab., Univ. of Pittsburgh Sch. of Medicine and Med. Center and Shadyside Hosps., Pittsburgh, Pa.): ACUTE TOLBUTAMIDE AND LEUCINE EFFECTS IN DIABETES MELLITUS. Metabolism *11*:1141-47, November 1962.

The authors studied the acute effects of tolbutamide and leucine in diabetics. The intravenous administration of tolbutamide induced an early hypoglycemia which was partially interrupted and followed in turn by the slower but more prolonged hypoglycemia, which differentiates this state from nondiabetes. The progressive hypophosphatemia noted was of lesser degree in the nondiabetics. Slight hypokalemia appeared in both groups. In diabetic patients, ingestion of L-leucine induced definite hyperglycemia in contrast to its lack of significant effect in nondiabetic controls. The accompanying hypophosphatemia was less than in the healthy nondiabetics, but the hypokalemia was comparable in the two groups. Despite the hyperglycemic effect of L-leucine, the combined administration of tolbutamide and leucine to diabetics accentuated the hypoglycemic effect of tolbutamide but did not cancel the early two-phase response. The hypophosphatemic effect of the two agents together was no greater than that seen with leucine alone. C.A.R., JR.

Dosekun, F. O. (Dept. of Physiology, University Coll., Ibadan, Nigeria): THE MEASUREMENT OF METABOLIC AND VASCULAR RESPONSES IN THE HUMAN SKELETAL MUSCLE WITH OBSERVATIONS ON ITS RESPONSES TO INSULIN AND GLUCOSE. Clin. Sci. *22*:287-94, April 1962.

The technic of internal calorimetry was used. Injections of insulin (40 U.) increased heat production in skeletal muscle, but had variable effect on skeletal muscle blood flow. Glucose given alone produced minor changes; glucose with insulin had essentially the same effect as insulin given alone. The authors conclude that the mode of action of insulin is local and direct on muscle tissue. G.D.M.

Dulin, W. E.; Schmidt, F. L.; Blanks, M. C.; and Lund, G. H. (Metabolic Diseases Res., The Upjohn Company, Kalamazoo, Mich.): HYPOGLYCEMIC ACTIVITY OF VALERAMIDE, 4-DI-

METHYLAMINO-N-METHYL-2, 2-DIPHENYL-, HYDROCHLORIDE. Proc. Soc. Exper. Biol. Med. *109*:721-24, March 1962.

The mode of action of this hypoglycemic agent was studied in rats. The authors suggest that the most likely mechanism for the action of Valeramide is decreasing glucose output by the liver. M.G.B.

Fox, Robert E.; Roberts, Harold K.; Oppenheimer, Henry E.; Goldenberg, Sidney; Bettonville, Paul J.; and Maha, George A. (St. Louis Diabetes Association, St. Louis, Mo.): A REPORT ON DIABETES DETECTION. J.A.M.A. *182*:622-25, Nov. 10, 1962.

A report on the results of a case-finding campaign in St. Louis using Dreypaks (filter paper tabs dipped in urine and returned by mail). In addition to testing with Benedict's solution one of two such papers stapled together, the second was tested with specific glucose oxidase, thus affording a comparison of the two testing methods.

Follow-up of those with positive tests was performed by one- to two-hour postprandial blood sugar determinations (Somogyi-Nelson), and the positive reactors to the latter test received a standard glucose tolerance test.

The screening postprandial blood tests were done in 460 (61 per cent) of the 748 subjects with glycosuria. Of these, 182 patients with values of 100 to 200 mg. per 100 ml. (Somogyi-Nelson) were recalled for glucose tolerance tests. Sixty-nine were diabetic and twelve probably diabetic. Whereas only four of twenty-seven patients with postprandial values of 160 to 200 mg. per 100 ml. had normal glucose tolerance tests, sixteen of thirty-one with postprandial values of 100 to 110 mg. per 100 ml. turned out to be diabetic.

Of 19,403 Dreypaks sent out, 18 per cent only were returned. A total of 1.6 per cent proved diabetic and only 0.4 per cent were *new* diabetics.

The specific enzyme test appeared to be twice as sensitive as the Benedict's method, but false positives were also increased. The authors further concluded that "the postprandial sugars in the 100 to 200 mg. per 100 ml. group proved to have a fairly inaccurate prognostic meaning as to the final diagnosis of diabetes mellitus." The first conclusion seems valid but the discrepancies which led to the second conclusion probably stem from the lack of control of the meal and the lack of strict insistence on a one-hour postprandial timing for the blood sugar.

There is a common lack of appreciation of the fact that a two-hour postprandial blood sugar in *early* diabetes may be misleadingly normal (as with the fasting) while the one-hour value may be diagnostically elevated. S.B.B.

Frandsen, V. Aasted; Pedersen, Jørgen; and Stakemann, Georg (The Hormone Dept., Statens Seruminstitut and Obstetrical Dept. B, Rigshospitalet, Copenhagen, Denmark): URINARY OESTRIOL EXCRETION IN DIABETIC PREGNANCY. Acta Endocr. (Kobenhavn) *40*:400-09, July 1962.

Conjugated oestriol was separated from glucose to eliminate the previously reported interference of urinary glucose with estimation of estrogens. Mean urinary excretion of oestriol in thirty cases of diabetic pregnancy was somewhat diminished but 80 per cent of the values were within the normal range. There was no correlation of oestriol excretion with the severity of diabetes. G.D.M.

Hillestad, Leif K. (Inst. for Res. in Thrombosis, University Hosp., Oslo, Norway): THE PERIPHERAL BLOOD FLOW IN INTERMITTENT CLAUDICATION. I. THE SIGNIFICANCE OF THE POSTURAL TESTS. Acta Med. Scand. *172*:301-05, September 1962.

Postural tests for arterial insufficiency were examined in patients with intermittent claudication. These were the plantar ischemic, the venous filling and the reactive hyperemia time tests. The results were compared with the capacity blood flow of the calf as obtained by plethysmography. All three tests correspond only poorly with the actual blood flow. The venous filling time test was best but prediction of the blood flow from a given time of venous filling was, however, hardly possible. The spontaneous variation of this test in the course of months was so great that it was considered unsuitable for follow-up examinations. The plantar ischemic test proved to be least reliable and was often negative in femoral artery occlusion with severely reduced capacity blood flow. The tests were all more positive in aorta-iliac than in femoral artery obstruction. The strongest degree of positivity occurred in obstruction of the crural arteries. B.F.K.

Hillestad, Leif K. (Inst. for Res. in Thrombosis, University Hosp., Oslo, Norway): THE PERIPHERAL BLOOD FLOW IN INTERMITTENT CLAUDICATION. II. THE SIGNIFICANCE OF SKIN THERMOMETRY. Acta Med. Scand. *172*:307-14, September 1962.

Skin temperatures of the feet before and after peripheral sympathetic block were matched against the calf blood flow as obtained by plethysmography. The calf flow at rest as well as after a standard amount of exercise was measured. Strict control of room temperature was essential for thermometry. There was considerable overlapping of skin temperatures before and after nerve block in limbs with normal and pathological arterial circulation. Plethysmography was superior to skin thermometry in assessing peripheral blood flow in limbs with intermittent claudication. B.F.K.

Hillestad, Leif K. (Inst. for Res. in Thrombosis, University Hosp., Oslo, Norway): THE PERIPHERAL BLOOD FLOW IN INTERMITTENT CLAUDICATION. III. THE SIGNIFICANCE OF OSCILLOMETRY. Acta Med. Scand. *172*:573-83, November 1962.

Oscillometric readings and the blood flow of the calf studied in normal limbs and in limbs with intermittent claudication of the calf gave no indication of the calf blood flow at rest nor did they reliably reflect the hyperemic blood flow following arrest of the circulation or ischemic and free exercise of the calf muscles. There was no essential difference between normal and ischemic limbs in the behavior of the pulsations after exercise. The oscillometric readings in ischemic limbs may give an idea of the capacity of the arterial circulation as may the pulse palpation. This idea is less correct the greater the proportion of collateral flow present. The monthly variation of oscillometric readings during unaltered flow was of a degree to restrict their value in follow-up studies of vascular disorders. In the study of ischemic limbs oscillometry should be regarded as a supplement to pulse palpation. B.F.K.

Hinkle, Lawrence E., Jr. (Cornell University Med. Coll., New York, N.Y.): CUSTOMS, EMOTIONS, AND BEHAVIOR IN THE DIETARY TREATMENT OF DIABETES. J. A. Diet. A. *41*:341-44, October 1962.

Dietary treatment of chronic illness such as diabetes mellitus is only in part an accurate chemical prescription of dietary allowances. More important—and warranting greater

effort on the part of physician and dietitian—are measures to enable the patient to *follow* diet with reasonable accuracy. Success is gained by understanding and sympathetic guidance of the patient based upon his ethnic, social, and family background. R.F.B.

Holden, H. M.; and Hiltz, J. E. (Nova Scotia Sanatorium, Kentville, N.S.): THE TUBERCULOUS DIABETIC. Canad. Med. Assn. J. 87:797-801, Oct. 13, 1962.

One hundred and six patients with diabetes and tuberculosis treated at the Nova Scotia Sanatorium since 1930 are reviewed. The need for all diabetics to have annual chest films is stressed when the tuberculin test is positive so that treatment in the combined diseases may be started early. Patients with tuberculosis and a family history of diabetes mellitus should be followed closely for the development of diabetes. Although the combination of tuberculosis and diabetes is serious, the prognosis has improved with the advent of antimicrobial therapy and the modern surgical treatment of tuberculosis. B.F.K.

Karam, John H.; and Grodsky, Gerold M. (Metabolic Res. Unit & Depts. of Medicine & Biochemistry, Univ. of California Med. Center, San Francisco, Calif.): INSULIN CONTENT OF PANCREAS AFTER SODIUM FLUOROACETATE-INDUCED HYPERGLYCEMIA. Proc. Soc. Exper. Biol. Med. 109:451-54, February 1962.

Extractable pancreatic insulin was measured by bioassay in normal rats, alloxan diabetic rats and rats made diabetic with sodium fluoroacetate (SFA). Rat insulin proved immunologically different from crystalline beef insulin. Pancreatic insulin was decreased or absent in alloxan diabetic rats. Pancreases of rats with SFA diabetes contained more insulin than controls. The diabetes produced by SFA is secondary to impaired peripheral glucose utilization. M.G.B.

Kimmelstiel, Paul (Milwaukee County Hosp., Milwaukee, Wis.): EDITORIAL: RENAL CHANGES IN DIABETES. Amer. J. Clin. Nutr. 11:253-54, October 1962.

With reference to new information made available by electron microscopic studies the morphology of diabetic renal disease and possible correlations with metabolic aberrations are discussed. Diabetic "nephropathy" commonly is taken to mean arterio- and arteriolosclerosis, pyelonephritis, papillary necrosis, certain types of glomerulosclerosis and tubular changes. Pyelonephritis soon may not be included because its frequency is more likely related to catheterization than to defective glucose metabolism.

Lesions generally considered indicative of diabetes are: glycogen-filled epithelial cells in the straight, distal portion of proximal convoluted tubules (Armanni-Ebstein cells), and nodular glomerulosclerosis.

Concerning the nodular lesions: (1) After "twenty-six years of aberration," it is clear that they are of intercapillary origin as originally described. (2) Doubt concerning their specificity has now been dispelled; the diffuse form of glomerulosclerosis has been shown to be much less specific. (3) Hypertension and the nephrotic syndrome are not related to them, but are more closely associated with the diffuse and mixed forms of glomerulosclerosis.

An hypothesis concerning the pathogenesis of the lesions of glomerulosclerosis is presented that perhaps can be tested experimentally. R.F.B.

LeFevre, Paul G. (Dept. of Pharmacol., Univ. of Louisville Sch. of Medicine, Louisville, Ky.): RATE AND AFFINITY IN HUMAN RED BLOOD CELL SUGAR TRANSPORT. Amer. J. Physiol. 203:286-90, August 1962.

After addition of any of six penetrant aldoses to suspensions of washed human erythrocytes at body temperature, serial samples were taken for analysis of sugar distribution between cells and medium. The progress of equilibration was analyzed in terms of a simple carrier model by which the sugar movements are characterizable by two constants, one of which defines the affinity of the sugar for the transport system's reactive site, the other expressing the rate of diffusion of the sugar-carrier complex through the cell membrane. The experiments show the latter constant to be nearly invariant among the several sugars, although the affinity constants and the net transfer times cover a wide range. M.G.B.

Lorber, Stanley H.; and Shay, Harry (Fels Res. Inst., Temple Univ. Sch. of Medicine, Philadelphia, Pa.): EFFECT OF INSULIN AND GLUCOSE ON GASTRIC MOTOR ACTIVITY OF DOGS. Gastroenterology 43:564-74, November 1962.

Insulin in a dose of 0.25 U. per kilogram of body weight was administered intravenously to four trained dogs fitted with an esophagostomy, gastric fistula and Heidenhain pouch. Motor activity of the main stomach was stimulated and that of the Heidenhain pouch was depressed coincidental with fall in blood glucose (maximum of 55 per cent). These changes were abolished by intravenous glucose and seemed to correlate more with changes in blood glucose than with absolute concentration. This may relate to the decrease in free to combined insulin as blood glucose falls, with impaired utilization of glucose by the gastric musculature. A.R.C., JR.

Metzler, W. S. (Dept. of Medicine, St. Joseph's Hosp., Toronto, Ont.): A REVIEW OF ORAL HYPOGLYCEMIC AGENTS. Canad. Med. Assn. J. 87:346-49, Aug. 18, 1962.

Oral hypoglycemic agents are appraised as to action, usefulness and toxicity. With consideration of the indications for use, the correct dosage and reasonable supervision of the patient, these preparations can be effective agents in the control of some diabetic patients. B.F.K.

Migliorini, R. H.; and Chaikoff, I. L. (Dept. of Physiol., Univ. of California, Berkeley, Calif.): PANCREATECTOMY IN RATS: ONSET OF METABOLIC CHANGES IN LIVER, ADIPOSE TISSUE, AND DIAPHRAGM. Amer. J. Physiol. 203:1019-23, December 1962.

The earliest changes following total pancreatectomy were observed in glucose utilization by liver and adipose tissue. Two hours after pancreatectomy the conversion of glucose carbon to (a) fatty acids, glycogen and CO_2 by liver slices and (b) fatty acids and CO_2 by adipose tissue was depressed. Defective incorporation of acetate into fatty acids occurred between four to fourteen hours after pancreatectomy in the liver and two to four hours after the operation in adipose tissue. Decreased glucose uptake by the diaphragm was observed four to fourteen hours after pancreatectomy. M.G.B.

Morgan, Carl R.; and Lazarow, Arnold (Dept. of Anatomy, Univ. of Minnesota, Minneapolis, Minn.): IMMUNOASSAY OF INSULIN USING A TWO-ANTIBODY SYSTEM. Proc. Soc. Exper. Biol. Med. 110:29-32, May 1962.

The reaction consists of two steps. In the first, insulin (tracer amounts of insulin-I-131 plus unlabeled insulin) forms a soluble complex with insulin antibody, obtained from im-

munized guinea pigs. In the second, this soluble complex is precipitated by antibody to guinea pig serum which is obtained from rabbits. The change in per cent radioactivity precipitated, as increasing amounts of unlabeled insulin are added in the first step, forms the basis of this assay. The method is sensitive to less than one microunit. M.G.B.

Neuman, Robert E.; and Tytell, Alfred A. (Virus and Tissue Culture Res. Div., Merck Inst. for Therapeutic Res., West Point, Pa.): POTENTIATED CYTOTOXICITY OF GLYCOLYTIC INHIBITORS BY PHENETHYLBIGUANIDE IN CELL CULTURE. Proc. Soc. Exper. Biol. Med. *110*:627-30, July 1962.

Cultured cells exposed to phenethylbiguanide and other respiratory inhibitors or uncouplers of phosphorylation exhibited an increased susceptibility to cytotoxicity of certain inhibitors of glycolysis. M.G.B.

Neuman, Robert E.; and Tytell, Alfred A. (Virus & Tissue Culture Res. Div., Merck Institute for Therapeutic Res., West Point, Pa.): STIMULATED GLYCOLYSIS OF KB CELL CULTURES BY GUANIDINE DERIVATIVES AND OTHER COMPOUNDS AFFECTING RESPIRATION. Proc. Soc. Exper. Biol. Med. *110*:622-26, July 1962.

A variety of respiratory inhibitors, uncouplers of phosphorylation, amidine and guanidine derivatives, including the hypoglycemic agents, synthalin and phenethylbiguanide stimulated glucose utilization and lactic acid production of cell cultures. M.G.B.

Picón-Reátegui, E. (Instituto de Biología Andina, Facultad de Medicina, Lima, Peru): STUDIES ON THE METABOLISM OF CARBOHYDRATES AT SEA LEVEL AND AT HIGH ALTITUDES. Metabolism *11*:1148-54, November 1962.

The changes in blood glucose, lactate, pyruvate, plasma inorganic phosphate and plasma potassium after oral administration of glucose were observed in two groups of adult males, one group at sea level, the other at an altitude of 14,900 feet. Although glucose concentration, both arterial and venous, was consistently lower in the high altitude group, the trend of the curves, after oral administration of glucose, was similar in both groups. The curve described by the high altitude group was lower, possibly due to the lower initial glucose concentration, as well as to greater carbohydrate utilization during the first thirty-minute period. Behavior of plasma inorganic phosphate and plasma potassium were the same at both altitudes. No explanation is available for the lower blood sugar level in the high altitude resident nor for the rise in pyruvate and lactate concentrations in the sea level group at the termination of the experiment. C.A.R., JR.

Rosenberg, Franklin J.; and DiStefano, Victor (Dept. of Pharmacol., Univ. of Rochester Sch. of Medicine, Rochester, N.Y.): A CENTRAL NERVOUS SYSTEM COMPONENT OF EPINEPHRINE HYPERGLYCEMIA. Amer. J. Physiol. *203*:782-88, November 1962.

At least half the hyperglycemic response (in hepatic venous blood) to intravenous epinephrine was found to be dependent on the integrity of the medulla oblongata caudal to the cerebellar peduncles. Transection of the medulla at the level of the fovea inferior unmasked a vagus-mediated hypoglycemic response to epinephrine. Changes in blood glucose concentration after epinephrine administration were independent of blood pressure and the base-line blood glucose levels. Microinjections of epinephrine into the floor of the fourth ventricle initiated an immediate hyperglycemic response without affecting blood pressure. It is concluded that only half the hyperglycemic response to epinephrine is due to direct peripheral action of epinephrine. The balance of the response is initiated by epinephrine-sensitive receptors in a hyperglycemic center in the floor of the fourth ventricle. It is suggested that the sympathetic innervation of the pancreas provides a pathway for the stimulation of alpha-cells to release glucagon in response to epinephrine stimulation of the medulla oblongata. M.G.B.

Rothlin, Martin E.; Rothlin, Christine B.; and Wendt, Vernon E. (Dept. of Medicine, Wayne State Univ. Coll. of Medicine, Detroit, Mich.): FREE FATTY ACID CONCENTRATION AND COMPOSITION IN ARTERIAL BLOOD. Amer. J. Physiol. *203*: 306-10, August 1962.

The effect of the administration of norepinephrine, glucose and insulin, pentobarbital, and Hypertensin on the arterial concentration and composition of plasma free fatty acids (FFA) has been studied in man and dog. With a rise of the FFA concentration as produced by norepinephrine, the contribution of oleic acid to the total FFA increased, while that of stearic and palmitic acids decreased. The reverse changes in the FFA composition were observed when the arterial FFA concentrations decreased under the influence of glucose and insulin. M.G.B.

Sagild, Uffe (Medical Dept. A, University Hosp., Copenhagen, Denmark): GLUCOSE TOLERANCE IN ACUTE ISCHEMIC RENAL FAILURE. Acta Med. Scand. *172*:405-11, October 1962.

Glucose metabolism was studied in nine patients with acute ischemic renal failure. Thirty-three intravenous glucose tolerance tests were made. In twelve sequences during the retention phase increasing blood urea concentration was associated with decreasing glucose tolerance in eleven instances. In nine sequences during the excretory phase, decreasing blood urea concentration was associated with increasing glucose tolerance in seven instances. In three sequences, hemodialysis was followed by increased glucose tolerance in all instances. B.F.K.

Scott, John C.; Finkelstein, L. J.; and Spitzer, John J. (Dept. of Physiol., Hahnemann Med. Coll., Philadelphia, Pa.): MYOCARDIAL REMOVAL OF FREE FATTY ACIDS UNDER NORMAL AND PATHOLOGICAL CONDITIONS. Amer. J. Physiol. *203*: 482-86, September 1962.

Myocardial arteriovenous difference in free fatty acids (FFA) and the coronary flow were determined in dogs under morphine-chloralose anesthesia. Fifteen minutes after the administration of insulin the arteriovenous difference decreased. FFA uptake also decreased, but this change was not statistically significant. Alloxan diabetes decreased the utilization per cent of FFA. Norepinephrine elevated myocardial uptake and arterial FFA. Hypoxia did not change FFA uptake. Hypothyroidism lowered myocardial uptake. M.G.B.

Serif, George S.; and Sihotang, Kadiman (Dept. of Biochemistry, Sch. of Medicine, State Univ. of South Dakota, Vermillion, S.D.): THYROID IODINE METABOLISM IN THE ALLOXANIZED RAT. Proc. Soc. Exper. Biol. Med. *109*:950-52, April 1962.

Rats rendered diabetic by a prolonged series of alloxan injections showed reduced thyroidal I-131 uptakes and subnormal thyroid hormone release rates. Treatment with insulin prevented these changes. Alloxan diabetic rats responded normally to TSH injections. The results suggest depressed secretion of thyrotrophic hormone in alloxan-diabetic rats. M.G.B.