Secretion of human growth hormone: physiologic and experimental modification. Metabolism *12*:577, 1963.

[25] Roth, J., Glick, S. M., Yalow, R. S., and Berson, S. A.: The influence of blood glucose on the plasma concentration of growth hormone. Diabetes *13*:355, 1964.

[26] Hunter, W. M., Fonseka, C. C., and Passmore, R.: Effect of exercise and feeding on plasma growth hormone levels. Biochem. J. *96*:75 p. 1965.

[27] Hill, A. V., Long, C. N. H., and Lupton, H.: Muscular exercise, lactic acid, and supply and utilization of oxygen. V. The recovery process after exercise. Proc. Roy. Soc., London, Ser. B *97*:96, 1924.

[28] Huckabee, W. E.: Relationships of pyruvate and lactate during anaerobic metabolism. II. Exercise and formation of $O_2$-debt. J. Clin. Invest. *37*:255, 1958.

[29] Krebs, H. A., and Yoshida, T.: Muscular exercise and gluconeogenesis. Biochem. Z. *338*:241, 1963.

[30] Nikkila, E. O., Torsti, P., and Penttilla, O.: Effects of fasting, exercise and reserpine on cathecholamine content and lipoprotein lipase activity of rat heart and adipose tissues. Life Sci. *4*:27, 1965.

[31] Cornil, A., De Coster, A., Copinschi, G., and Franckson, J. R. M.: Effect of muscular exercise on the plasma level of cortisol in man. Acta Endocr. *48*:163, 1965.

[32] Porte, D., Jr., Graber, A. L., Kuzuya, T., and Williams, R. H.: The effect of epinephrine on immuno-reactive insulin levels in man. J. Clin. Invest. *45*:228, 1966.

[33] Gourley, D. R. H., and Fisher, K. C.: The role of lactate in the stimulation of the oxygen consumption of frog muscle by insulin. Canad. J. Physiol. Pharmacol. *42*:139, 1964.

# *REPORT TO THE EDITOR*

# 1966 Award Essays of the New York Diabetes Association

Prize-winning entries in the Third Annual Prize Essay Contest on diabetes mellitus, sponsored by the Clinical Society of the New York Diabetes Association for House Staff Officers and Fellows of hospitals in the metropolitan New York area, were presented on May 19 at a meeting of the Society at the New York Academy of Medicine.

Judges of the contest were James Berkman, M.D., Martin Goldner, M.D., Irving Graef, M.D., and Harold Rifkin, M.D.

The abstracts of the winning papers follow.

MAX ELLENBERG, M.D.
*Chairman, Prize Essay Contest Committee*

## FIRST PRIZE

*Effects of Diazoxide Administration on Plasma Glucose, Insulin, and Lipids in Von Gierke's Disease*

**Gabriel Spergel, M.D.,** Fellow in Diabetes and Endocrinology, Metabolic Research Unit, The Jewish Hospital of Brooklyn, Brooklyn, New York.

Diazoxide, a nondiuretic thiazide, has been noted to cause hyperglycemia and has been used therapeutically in the treatment of the hypoglycemia associated with leucine sensitivity and insulinomata.

The mechanisms by which this drug induces hyperglycemia were studied during the treatment of a twelve-year-old boy with type I glycogen storage disease and marked hyperlipemia.

(1) Inhibition of the plasma immunoassayable insulin response to administered glucose was shown, as well as an increase of 30 to 70 mg. per 100 ml. in postprandial plasma glucose levels. Oral glucose tolerance decreased during treatment with diazoxide. These changes in plasma glucose were not due to glycogenolysis, by virtue of the enzymatic defect present in this patient.

(2) During treatment, skin xanthomata disappeared although plasma triglycerides rose. Serum cholesterol was unchanged while plasma free fatty acids initially rose but subsequently spontaneously declined.

(3) Analysis of serial oral glucose tolerance tests suggests that diazoxide inhibits hepatic glucose uptake, as part of its hyperglycemic action.

## SECOND PRIZE

*Reevaluation of the Role of Calcium Ion in Corticotropin-induced Lipolysis in Vitro*

**Melvyn Klein,** Fourth year student, Downstate Medical Center, Brooklyn, New York.

The calcium-dependent nature of corticotropin (ACTH) induced lipolysis in vitro, shown by Engel

et al., was reinvestigated. Epididymal fat tissue from fasted Wistar rats was incubated in Krebs-Ringer bicarbonate buffer. Incubated tissues and media were then analyzed for free fatty acid (FFA) release. The three hypotheses examined, and the results of these investigations, were:

(1) *Calcium could reduce glucose entry into fat tissue and, by diminishing triglyceride synthesis, facilitate net lipolysis.* In the presence of 1 mg. per ml. ethylenediamine tetraacetate (EDTA) and 2 gm. per 100 ml. albumin, the lipolytic response to 1 ug. per ml. ACTH was found to be dependent on the presence of added calcium, irrespective of the presence or absence of glucose in the medium.

(2) *The lipolytic system activated by ACTH could require calcium to function.* EDTA suppressed ACTH-activated lipolysis only in the presence of albumin: in its absence, EDTA was wholly without liposuppressive effect.

(3) *Primary ACTH receptor sites might contain calcium whereas under EDTA-blockade less specific sites (for example, sulfhydryl groups), could permit ACTH attachment to fat tissue.* In the presence of EDTA, inhibition of ACTH-induced lipolysis was logarithmically related to albumin concentration in the incubation media. Sulfhydryl-group blockade proved ineffective in inhibiting ACTH-activated lipolysis in the absence of albumin. Several high molecular weight polypeptides and carbohydrate polymers were substituted for albumin in the presence and absence of EDTA, but had no liposuppressive effect.

These experiments suggest that the role of calcium in ACTH-activated lipolysis is to permit or facilitate ACTH attachment to adipose tissue.

## THIRD PRIZE

*Effects of Induced Hypokalemia on Carbohydrate Metabolism, FFA, Tissue Potassium, and Glycogen in the Rat*

**Philip Schmidt, M.D.,** Fellow in Diabetes and Endocrinology; **Gabriel Spergel, M.D.,** Fellow in Diabetes and Endocrinology; and **Alan Stern, M.D.,** Intern in Medicine, the Jewish Hospital of Brooklyn, Brooklyn, New York.

The relationship between the potassium ion and carbohydrate metabolism has been the object of renewed interest. An animal study was undertaken to correlate changes in plasma glucose, free fatty acids, and tissue glycogen with alterations in plasma and tissue potassium.

Forty-eight male Wistar rats were divided into three groups and fed a low potassium diet for two weeks:

Group I—Controls, saline injected for seven days, diet, supplemented with potassium.

Group II—DOCA injected for seven days, no potassium supplementation.

Group III—Same as II but with potassium supplementation.

One week after the last injection, fasting animals were anesthetized and heart blood drawn for potassium, glucose, and FFA. An intracardiac injection of glucose (1 gm. per kg.) was given and tail blood sampled for glucose at five-minute intervals for thirty minutes. Two hours after glucose injection, heart blood was again collected for potassium, glucose, and FFA, the animal sacrificed, and tissue (muscle, liver, and epididymal fat pad) obtained for potassium and glycogen determinations.

1. Profound hypokalemia was established in Group II while normal serum potassium was maintained in Groups I and III.

2. Significantly, adipose tissue and liver showed no loss of potassium despite marked decreases in both plasma and muscle potassium in Group II.

3. Potassium depletion did not produce a significant change in glucose disappearance rate. Fasting and two-hour glucose values, however, were significantly elevated in potassium-depleted animals.

4. Liver and muscle glycogen was significantly increased in the potassium-depleted animals.

5. Plasma FFA (fasting and post-glucose) were unaffected by potassium depletion.

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# *BOOK REVIEW*

ANNUAL REVIEW OF BIOCHEMISTRY. *Edited by P. D. Boyer. $11.50. pp. 908, plus 91 pages of index. Annual Reviews, Inc., Palo Alto, California. Volume 35, Parts I and II, 1966.*

Significant recent developments in twenty-five different areas of biochemical research have been competently and critically analyzed in volume thirty-five of the *Annual Review of Biochemistry.* This comprehensive review affords an awesome glimpse of the enormous expansion that is taking place in biological knowledge; the deeper insight into biochemical processes that the newer observations provide is truly stimulating.

Important advances in our understanding of the composition, conformation and metabolism of macromolecules are de-